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ABSTRACT

The 12 papers presented at the Research Symposium of the National Middle School Association's 1980 Annual Conference are reproduced in this document. Topics covered are teachers', principals', and national leaders' perceptions of the middle school: priorities of needs, competencies, and training of middle grade teachers; a case study of the transition of a seventh grade center to a middle school; middle and junior high school students' attitudes toward family influences and generational differences; an observational study of core and departmentalized eighth grade classrooms; problem-solving strategies of transitional early adolescents; development of a scale for measuring teacher time use; development of instrumentation for determining teachers' disciplinary styles; relationships between teacher behavior and student participation in ninth grade algebra classes and middle grade science classes; effects of differentiation of instruction on academic achievement and particularly on reading skill retention; and abuse of drugs and related substances. (PGD)

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MIDDLE SCHOOL RESEARCH STUDIES

1980

Joint effort of the

National Middle School Association's

Research Committee
and
Publications Committee

EA 013 190

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PREFACE

The Publications Committee of the National Middle School Association is pleased to be able to provide this volume of current research studies of significance to middle school education. These studies have been selected by the Research Committee of the National Middle School Association to be presented at the Research Symposium at the Annual Conference of the National Middle School Association held in Nashville, November 12-15, 1980. Due to constraints of time, and in order to keep the cost at a minimum, the studies have been reproduced as submitted, without re-typing or editing.

Howard Johnston and Glenn Markle assisted by Loretta DeVore, all from the University of Cincinnati, have coordinated the selection of research studies for the symposium and for this publication. The following persons have served as referees in the selection process.

Alfred A. Arth
University of Wyoming

Sherrel Bergmann*
National College of Education

Tom Bohlinger*
Robinson Middle School

Don Clark*
University of Arizona

Jon E. Draud
Ludlow Public Schools

James Fox
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University of Montana

*Member of NMSA Research Committee

Research studies presented at earlier NMSA conferences have been published by the University of Wyoming in their Middle School Research Annuals I, II and III, which are now out of print. Fourteen of these studies, however, have been selected by the NMSA Research Committee for inclusion in another NMSA publication entitled Middle School Research: Selected Studies 1977-79.

The paucity of good research in middle school education is often lamented. The National Middle School Association hopes that these publications will contribute in a small way to the alleviation of this problem.

Donald Deller, Westchester Middle School
Myrle Hemenway, University of Colorado
William Powell, University of Georgia
Deborah Pugh, Detroit Public Schools
Jane Vogel, Winnetka Public Schools
Donald Steer, Chair, University of Michigan
NMSA Publications Committee

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THE MIDDLE SCHOOL AS PERCEIVED BY TEACHERS, PRINCIPALS AND NATIONAL LEADERS

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Introduction

The National Middle School Study was originated and conducted during the 1977-1978 and 1978-1979 academic school years. The research study consisted of two components: (1) an information survey to collect and describe the workings of middle schools from national leaders, coordinators in State Departments of Education, principals and teachers in exemplary middle schools, and (2) an attitudinal questionnaire to collect information about the perceptions of the national leaders, coordinators, principals and teachers indicated above toward certain functions and characteristics of the middle school relating to students, teachers, principals, curriculum and facilities and organization. The principals', teachers' and leaders' responses to the attitudinal questionnaire are described in this paper.

Description of the Study

Sample

This paper will report the results from the attitudinal study based on 153 principals (63.7%), 567 teachers (72.5%) and national leaders (70.0%) who responded to the study. The respondents represented thirty-seven states.

The sample of national leaders was identified from a review of the literature and convention procedings of professional organizations to determine the prominent leaders of the national middle school movement. In addition, as leaders were sampled about their attitudes they were requested to recommend additional leaders of the middle school movement.

The principal sample was selected from middle schools previously identified as exemplary middle schools by a number of educational authorities including national leaders, State Department of Education coordinators, professional organizations and educational literature. The term, exemplary, implied middle schools which were recognized by the previously cited educational authorities as employing successful middle school practice. The authors of this study recognize the limitations and inadequacies of compiling a representative list of exemplary middle schools from the various educational authorities. In some instances, exemplary middle schools may have been omitted from consideration and still others may not have responded to the study.

The teacher sample was selected by sending a follow-up letter to principals in exemplary middle schools (who had already responded to this study) asking their permission to sample six to ten of their classroom teachers. If permission was given, principals were asked to select teachers and one counselor according to the following criteria: (1) all grades found in the school were represented in the teachers selected, (2) all subject areas taught in the school were represented, (3) the questionnaire was shown to teachers and their approval obtained before principals recommended them, and (4) a list containing the participants names was returned to the investigators who in turn sent the questionnaire to the designated teachers.

Instrument

A questionnaire of 57 Likert items was designed from various educational resources including educational literature, doctoral dissertations, various middle school studies and ERIC searches. The instrument was designed to determine the attitude of middle school principals, teachers and leaders toward the functions and characteristics of the middle school with respect to five school components: students (10 items), teachers (13 items), principals (12 items), curriculum (12 items), and facilities and organization (10 items). (See Appendix I). The principals, teachers and leaders were asked to indicate whether they strongly agreed (SA), agreed (A), disagreed (D), or strongly disagreed (SD), with characteristics in the attitudinal statements. The responses were coded as follows: SA=4, A=3, D=2, and SD=1. Thus, a high score indicated a strong endorsement of a statement while a low score represented a weak endorsement. The principals, teachers and leaders were instructed to reflect the actual middle school operations and practices rather than the ideal practices in their responses.

A pilot questionnaire was field tested by professional educators representing middle school principals, teachers and graduate students enrolled in classes in middle school education at the University of South Carolina, College of Education faculty and a State Department of Education coordinator. The professional educators' reactions formed the basis from which the instrument was revised. The revised questionnaire was mailed to 65 national leaders in June, 1977. A follow-up mailing was completed in September, 1977. The same questionnaire was mailed to 240 principals of exemplary middle schools in November, 1977. A follow-up mailing was completed in January, 1978. The final mailing of the same questionnaire was sent to 782 teachers in April, 1978. A follow-up mailing was completed in October, 1978.

Analysis Procedures

The data analyses were concerned with providing a comprehensive description of the principals', teachers' and leaders' responses. The analyses included an examination of the frequency of responses across the five categories for each item, examination of the mean item responses, intercorrelation of the items, factors analysis of items both within and across the five major areas and an investigation of the responses aggregated within the five major areas. Regional differences were also examined.

The primary analysis described in the paper will focus on the mean item responses. The mean item response for each item of each sample was calculated and the items were than rank ordered for each sample within the five subcategories from the item with the highest mean response to the item with the lowest mean response. Within each subcategory the three items with the highest mean responses were operationally defined as receiving strong endorsement. The three items with the lowest mean response were operationally defined as receiving a weak endorsement. It is important to note while three items are operationally defined as having received a weak endorsement this is based on a relative comparison and does not imply a negative endorsement. The top three items will be discussed as the most strongly endorsed statements, the lowest ranking three items will be discussed as receiving a weak endorsement.

Findings

Before describing the principals', teachers' and leaders' respones, it is important to provide a brief description of the measurement properties of the questionaire. First, the internal consistency reliability was caluculated using the Cronback Alph Index of Reliability. The internal responses of the principals indicated: (1) students (.9319), (2) teachers (.9308), (3) principals (.9290), (4) curriculum (.9573), and (5) facilities and organization (.8625). In contrast

the internal responses of teachers indicated: (1) students (.7142), (2) teachers (.7457), (3) principals (.7600), (4) curriculum (.7797), and (5) facilities and organization (.6919). Whereas, the internal responses of leaders indicated: (1) students (.9394), (2) teachers (.9440), (3) principals (.9611), (4) curriculum (.9482), and (5) facilities and organization (.8415). Second, the dimensionality of the five subcategories was examined by means of factor analysis with varimax rotation. The factor analysis reveals strong within scale item homogeneity for both principals, teachers and leaders. For the student, principal and curriculum subcategories the factor analysis revealed a single undimensional factor in each groups' responses. The subcategory dealing with the teacher contained thirteen items that loaded on two factors. The major factor contained twelve items and dealt with clasroom management and the second factor contained one item and dealt with teacher responsibilities. For the facilities and organization subcategory there were two factors: the major factor contained nine items which were concerned with general physical facilities and organizational procedures and the second factor contained one item which dealt with organizational practice.

Subcategories

The means for each of the 57 Likert items are show in Appendix I. For each item in the five subcategories the mean responses were calculated for the principal (MP), teacher (MT) and leader (ML) responses.

Within each of the five subcategories the items were rank ordered from the item with the highest mean response to the item with the lowest mean response for principals (PE), teachers (TE), and leaders (LE) groups. The top three items in each subcategory for each responding group will be separately discussed as receiving a strong endorsement; the lowest ranking three items will be discussed as receiving weak endorsement. The strongest and weakest endorsements for the three groups are shown in Appendix II. A comparison of the similarities and differences between principals', teachers' and leaders' responses will be reported.

Student Subcategory

In the student subcategory both principals and teachers indicated strongest endorsement on the need for basic skills (MP=3.451), (MT=3.220). In contrast, leaders gave strongest endorsement to focusing on students learing to learn. (ML=3.200). The second endorsement by principals was on the development of a healthy self-concept (MP=3.405). Teachers stressed students learning to learn (MT=3.168) and leaders stressed the development of healthy self-concept (MT=3.086). The third area of strong endorsement by principals was on encouraging satisfactory personal and social adjustment (MP=3.346), in contrast, to teachers who stressed the need for development of a healthy self-concept (MT=3.101). Leaders were equally divided on their third endorsement among fostering satisfactory personal and social adjustment, helping in the formulation of personal values and moral standards and emphasizing basic skills (ML=2.971).

The weak endorsement response items which principals expressed were maximizing the individual's academic development (MP=3.039), encouraging individual initiative and effort directed toward cognitive achievement (MP=3.157), and stressing skills necessary for survival in society (MP=3.176). In contrast teachers expressed weak endorsements for providing learning activities directed toward the development of good citizens (MT=2.841), stressing skills necessary for survival in society (MT=2.850), and providing the discipline necessary for student learning (MT=2.910). By comparison leaders were equally divided in their weakest endorsement between maximizing the individual's academic achievement and providing the discipline necessary for student learning (ML=2.714). The third area of weak endorsement was placed by leaders on stressing the skills necessary for survival in society (ML=2.800).

It would appear that specific quantitative statements like those in the preceding paragraph were no longer considered defensible student goals by middle school principals, teachers and leaders. Terms such as citizenship and discipline seem to elicit less support than they would have a decade ago. All three responding groups indicated a need for basic skills and a healthy self-concept. From the principals' perspective there appeared to be a need for more personal and social adjustment, whereas, the classroom teacher and leaders seemed to place more emphasis on students learning to learn. However, all three groups' responses were in agreement over the strong endorsements and only disagreed as to the relative strength of the strong endorsements.

Teacher Subcategory

In the teacher subcategory principals indicated that the highest endorsement should be placed on the teacher's willingness to support guidance and counseling services (MP=3.340), the second endorsement was the teacher's willingness to assume a variety of teaching roles (MP=3.327), and the third was the utilization of team planning and teaching (MP=3.307). Conversely, teachers and leaders indicated the primary responsibility of teachers was to assume a variety of teaching roles (MT=3.238) and (ML=2.971). Teachers gave their second and third strong endorsements to support the guidance and counseling services (MT=3.224) and utilization of a variety of instructional techniques in their teaching (MT=3.171). By contrast, the leaders were equally split on second and third endorsements between utilizing a variety of instructional techniques in their teaching and being accountable for student's academic achievement (ML=2.914).

In contrast, principals and teachers gave their weakest endorsement to teacher's participation in state and national meetings (MP=2.732), (MT=2.668), in comparison to leaders who gave their weakest endorsement to the application of research findings to classroom teaching (ML=2.286). The second weak endorsement of principals and teachers was placed on the application of research findings in the classroom (MP=2.752), (MT=2.707), and the third weak endorsement was given to establishment of a climate of student freedom and self-directed learning (MP=2.843), (MT=2.750). The second and third weak endorsements of leaders were equally divided between teacher's participation in state and national meetings and conferences and the establishment of a climate of student freedom and self directed learning (ML=2.600).

Teachers and leaders emphasized a variety of teaching roles as being important in the classroom, whereas, principals stressed the teacher's support for the guidance and counseling services. From the principals' responses toward guidance it was not possible to determine whether the classroom teacher in the middle school should be further trained for the guidance and counseling services. National leaders did not stress the need for guidance. The areas strongly endorsed by only one of the responding groups were the utilization of team planning and teaching (endorsed by principals only), utilization of a variety of instructional techniques in their teaching (endorsed by teachers only) and the provision for being accountable for the student's academic achievement (endorsed only by leaders). It would appear that principals responded to the teacher subcategory from the responsibility of the building principal for instructional evaluation. On the other hand, teachers based their responses on the evaluation critieria for effective classroom teaching. National leaders seemed to be more in agreement with the teachers. Teachers did not see their classroom effectiveness being evaluated by their attendance at state and national meetings or by the application of research findings in their classrooms. The failure to encourage attendance at state and national meetings and the application of research findings to the classroom may in part account for why innovations and changes take so long to be implemented into the classroom.

Principal Subcategory

Within the principal subcategory the building principal saw his strongest endorsement as the involvement of staff in solving school problems (MP=3.471). His instructional leadership role was considered as second in importance (MP=3.412). The third strongest endorsement expressed the concern that principals possess previous teaching experience at the middle or junior high school level (MP=3.261). Conversely, teachers indicated that the first priority for strong endorsement in the principal subcategory should be on principals participating in state and national meetings and conferences (MT=3.136). The teachers' second strong endorsement dealt with the principal's willingness to utilize his staff in solving school problems (MT=3.086). The third strong endorsement was the provision for a planned system of parental involvement on a regular basis (MT=2.965). By contrast, national leaders were equally divided on their strongest endorsement between principal's participation in state and national meetings and conferences and the utilization of the staff in solving school problems (ML=2.800). The third strong endorsement was given to having the final decision in the employment of faculty/staff (ML=2.714). In comparison, principals indicated weak endorsement for the utilization of management principles based on systems design (MP=2.536), participation of principals in school board meetings (MP=2.705), and involvement of teachers in the selection of faculty and staff (MP=2.797) as prerequisites to the administration of a successful middle school. Leaders were in agreement with principals on first weak endorsement for the utilization of management principles based on systems design (ML=2.029) and second weak endorsement for participation of principal's in school board meetings (ML=2.057) and disagreed with principals on third weak endorsement selecting the employment of teachers trained to teach early adolescents (ML=2.371). Teachers, on the other hand, gave weak endorsement to the principal's involvement of teachers in the selection of faculty and staff (MT=2.307), utilization of management principles based on systems design (MT=2.545), and participation of the principal in school board meetings (MT=2.626).

The findings indicated that there was less agreement between principals and teachers over the principal's leadership role. Teachers see the principal's major leadership role as facilitating the classroom teacher's effectiveness by participation of the principal in state and national meetings and the involvement of the staff in solving the school problems. In contrast, the results of the study indicate that principals were primarily concerned with providing instructional leadership through direct teacher involvement. By comparison, leaders agreed with teachers that the principals should participate in state and national conferences and meetings and utilize staff in solving school problems, but went further to suggest that teachers need to have a role in faculty selections. It is interesting to note with the stress placed on team teaching and planning in middle schools one would assume that both teachers and principals would strongly endorse teachers' participation in staff selection process. However, neither principals nor teachers supported teacher's participation in staff selection in contrast to leaders who did see teacher's participation as a necessary endorsement.

Curriculum Subcategory

In the curriculum subcategory principals, teachers and leaders were in agreement concerning the strongest endorsement, development and refinement of basic skills (MP=3.454), (MT=3.145) and (ML=2.971). Principals and teachers on the second strong endorsement supported depth, breadth and sequence of subject matter (MP=3.307), (MT=3.063), whereas, leaders endorsed participation in student activities (ML=2.943). Principals and leaders gave the notion of a balanced curriculum their third endorsement (MP=3.288). (ML=2.800), while teachers gave their third endorsement to continuous progress (MT=3.009).

Principals, teachers and leaders gave their weakest endorsement to the item dealing with core curriculum (MP=2.582), (MT=2.457) and (ML=2.143). Principals gave their second weak endorsement to provisions for exploratory programs in career education (MP=2.948), in contrast to teachers and leaders who gave their second weak endorsement to the establishment of specific classes for exceptional children (MT=2.649) and (ML=2.200). Principals indicated their third item of weak endorsement was the establishment of specific classes for exceptional children (MP=2.987), whereas, teachers gave weak endorsement to the provosion for exploratory programs in career education (MT=2.693). By comparison leaders gave their third weakest endorsement to the focusing on competencies as the basis for curriculum design (ML=2.257).

All three responding groups were in close agreement within the curriculum subcategory, Principals, teachers and leaders were in agreement concerning their strongest endorsement stressing basic skills. Principals and teachers were in agreement on the sequencing of subject matter. Even with the "Back to the Basics" movement the principals and leaders continued to stress the need for a balanced curriculum while, in contrast, teachers appeared to view the curriculum from an instructional standpoint advocating varied and continuous progress. The fact that neither principals, teachers nor leaders stressed the expansion of classes for exceptional children would appear to reflect the acceptance of the concept of mainstreaming.

Facilities and Organization Subcategory

In this subcategory principals, teachers and leaders were in agreement concerning their highest endorsement, broadening the program to include shops, labs and special enrichment classrooms (MP=3.373), (MT=3.192), and (ML=2.971). Principals gave their second and third endorsements to individualized instruction (MP=3.183) and team teaching (MP=3.169), whereas, teachers agreed but reversed their endorsements giving their second endorsement to team teaching (MT=3.018) and their third endorsement to individualized instruction (MT=2.899). In contrast, leaders gave their second endorsement to individualized instruction (ML=2.886) and their third endorsement to flexible multi-purpose buildings (ML=2.686).

Principals, teachers and leaders were in agreement concerning their weakest endorsement, maintaining the self-contained classroom for grades 5 and 6 (MP=2.092), (MT=2.000) and (ML=2.257). Principals and teachers were in agreement on second weak endorsement, introducing departmentalization at grades 5 and 6 (MP=2.431), and (MT=2.584), whereas, leaders gave second weak endorsement to the provision for transition between self-contained and departmentalization (ML=2.286). Principals gave ability grouping their third weakest endorsement (MP=2.732) while teachers gave providing for the transition between the self-contained classroom and departmentalization their third weak endorsement (MT=2.616). The leaders were equally divided between the provision for homogeneous grouping and the establishment of flexible modular scheduling (ML=2.314).

In a time of declining enrollments and the "Back to the Basics" movement, it would appear difficult to convince the public of the need for additional building space for shops, laboratories and learning centers unless the justification can be linked with improving the basic skills. The mean item responses of the subcategory indicated a greater range of disagreement over the necessary facilities and organization required for a middle school by the three responding groups. Transition, one of the key functions of a middle school, was given weak endorsement by principals, teachers and leaders.

Regional Variation

The thirty-seven states represented in the three samples were divided into seven regions which included New England, Mid-Atlantic, South, Midwest, Southwest, Rocky Mountains and Far West. These were used as independent variables in a one way analysis of variance. The dependent variables were the five subcategory totals. There were no significant differences in any of these analyses in the three samples.

Conclusions

In summary, the study provides a broad description of the principals', teachers' and leaders' perceptions of functions and characteristics of exemplary middle schools in the five subcategories of student, teacher, principal, curriculum and facilities and organization. The major substantive conclusions seem to indicate:

(1) the overall responses of principals', teachers' and leaders' attitudes toward the functions and characteristics of the middle school indicated general agreement within the five subcategories.

(2) each group perceived their responses within the context of their respective roles as principal, teacher or leader.

(3) leaders responded to the questionnaire from what they believe would promote an effective middle school.

(4) teachers responded to the attitudinal questionnaire according to how they were evaluated and judged as successful teachers.

(5) principals responded to the attitudinal questionnaire from the perspective of providing effective instructional leadership in their schools.

(6) principals, teachers and leaders did not strongly support the current emphasis at the national level on training teachers specifically for working with early adolescents.

(7) neither principals, teachers or leaders saw the need for utilizing educational research findings in the classroom.

(8) principals, teachers and leaders emphasized basic skills but at the same time principals and leaders stressed the need for maintaining a balanced curriculum.

(9) teachers and principals (the school practitioners) have one set of perceptions concerning the middle school while leaders (the school theorists) had a slightly different set of perceptions.

In summary the paper offers a comprehensive description of the attitudes of three groups of educators toward the middle school with respect to students, teachers, principals, curriculum and facilities/organization. Several differences were observed between teachers and principals when contrasted with national leaders. These differences are described as indicative of a practical versus a theoretical orientation. Implications of the study for the future development of the middle school are described.

NATIONAL MIDDLE SCHOOL STUDY
APPENDIX I

Appendix I contains a sample of the questionnaire used in the study. For each question the Appendix shows (1) the mean response for national leaders (ML), (2) mean response for principals (MP), and (3) mean response for teachers (MT).

The study seeks to determine the attitudes of educators toward certain functions and characteristics of middle schools. You will be asked to respond to statements concerning students, teachers, principals, curriculum, and organization. Your responses should reflect your attitudes toward middle schools as they actually operate not as they ought to operate. Responses to the questionnaire will be completely confidential.

The Student

ML	MP	MT	For the student, the middle school . . .
3.200	3.294	3.168	Focuses on students learning to learn
2.971	3.261	3.012	Helps in the formulation of personal values and moral standards
2.971	3.345	3.090	Fosters satisfactory personal and social adjustment
3.086	3.405	3.101	Fosters the development of a healthy self-concept
2.714	3.288	2.910	Provides the discipline necessary for student learning
2.914	3.157	3.034	Encourages individual initiative and effort directed toward cognitive achievement
2.800	3.176	2.850	Stresses the skills necessary for survival in society
2.971	3.451	3.220	Emphasizes reading, writing, and arithmetic skills as basic to individual development
2.714	3.183	2.841	Maximizes the individual's academic development
2.857	3.039	3.026	Provides learning experiences directed toward the development of a good citizen

The Teacher

ML	MP	MT	The middle school teacher . . .
2.771	3.248	3.153	Establishes a creative learning environment for early adolescer
2.857	3.340	3.224	Supports the guidance and counseling services
2.886	3.194	3.090	Implements variable groups--large/small, multiage, alternative, etc.
2.800	3.307	3.056	Utilizes team planning and team teaching
2.600	2.843	2.750	Establishes a climate of student freedom and self-directed learning
2.914	3.143	2.954	Provides for, insists upon, and is accountable for student academic achievement
2.971	3.327	3.238	Assumes a variety of teaching roles--facilitator, manager
2.914	3.261	3.171	Utilizes a variety of instructional techniques--peer teaching, simulations and games, inquiry, etc.
2.714	3.294	3.144	Communicates effectively to parents concerning the child's performance in the school program
2.600	2.732	2.688	Participates in state and national meetings and conferences
2.286	2.752	2.707	Applies the findings of educational research to classroom teaching
2.800	3.209	3.032	Works to design learning activities and strategies to meet the diverse learning styles of the students
2.800	3.026	3.014	Establishes a climate of classroom discipline and teacher-directed learning

The Principal

ML	MP	MT	The middle school principal . . .
2.057	2.705	2.626	Participates in school board decision making processes
2.029	2.536	2.545	Utilizes management principles based on systems design
2.686	3.412	2.829	Provides instructional leadership in middle school programs
2.371	3.052	2.869	Employs teachers trained in teaching early adolescents
2.657	3.261	2.947	Possesses previous teaching experience in middle or junior high schools
2.543	3.120	2.945	Develops and controls the budget for his school
2.600	3.092	2.965	Provides a system for parent input on a regular basis
2.714	3.118	2.822	Employs or has the final decision in the employment of faculty/staff
2.457	2.797	2.307	Involves teachers in the selection of faculty/staff
2.800	3.227	3.136	Participates in state and national meetings and conferences
2.200	3.084	2.907	Applies the findings of educational research to school administration
2.800	3.471	3.086	Utilizes staff in solving school problems

The Curriculum

ML	MP	MT	The middle school curriculum . . .
2.486	3.307	3.063	Requires depth, breadth and sequence in subject matter
2.971	3.454	3.145	Continues the development and refinement of basic skills
2.257	3.013	2.765	Focuses on competencies as the basis for curriculum design
2.800	3.288	2.924	Encourages a proportional balance between subject matter and exploration in elective areas, the fine arts and career education
2.400	3.203	3.009	Provides for varied and continuous progress in subject matter
2.200	2.987	2.649	Establishes specific classes for all types of exceptional children
2.829	3.163	2.825	Considers both child-centered and subject-centered concerns in a balanced curriculum
2.943	3.131	2.988	Encourages participation in activities--clubs, student government, dramatics, recreation, etc.
2.629	3.013	2.720	Focuses on humanistic concerns as the basis for curriculum design
2.686	3.000	2.891	Provides for mastery achievement in skills and concepts
2.714	2.948	2.693	Provides for exploration and training in career education
2.143	2.582	2.457	Focses on the core curriculum concept as the basis for curriculum design

Facilities and Organization

ML	MP	MT	Regarding facilities and organization, the middle school . . .
2.314	2.732	2.785	Provides for homogeneous or ability grouping
2.543	3.169	2.018	Provides for team teaching
2.314	2.856	2.651	Establishes flexible/modular scheduling
2.257	2.092	2.000	Maintains the self-contained classroom for grades 5 and/or 6
2.286	3.007	2.616	Provides for transition between the self-contained classroom and departmentalization
2.371	2.431	2.584	Introduces departmentalization at grades 5 and/or 6
2.371	2.856	2.617	Fosters alternative school programs to meet the needs of students
2.886	3.183	2.899	Encourages developments in individualized instruction, independent study, learning centers, and the like
2.686	2.948	2.829	Requires a building permitting flexible, multi-purpose utilization
2.971	3.373	3.192	Broadens the program to include shops, labs, and special enrichment classrooms

NATIONAL MIDDLE SCHOOL STUDY
APPENDIX II

Appendix II indicates the three strongest endorsed items (lowest numbers) and the three weakest endorsements (highest numbers) for national leader's endorsements (LE), principal's endorsements (PE) and teacher's endorsements (TE).

The study seeks to determine the attitudes of educators toward certain characteristics and functions of middle schools. You will be asked to respond to statements concerning students, teachers, principals, curriculum and organization. Your responses should reflect your attitudes toward middle schools as they actually operate not as they ought to operate. Responses to the questionnaire will be completely confidential.

The Student

LE	PE	TE	For the student, the middle school . . .
1		2	Focuses on students learning to learn
3			Helps in the formulation of personal values and moral standards
3	3		Fosters satisfactory personal and social adjustment
2	2	3	Fosters the development of a healthy self-concept
9.5			Provides the discipline necessary for student learning
	10	8	Encourages individual initiative and effort directed toward cognitive achievement
8	9	9	Stresses the skills necessary for survival in society
3	1	1	Emphasizes reading, writing, and arithmetic skills as basic to individual development
9.5	8	10	Maximizes the individual's academic development
			Provides learning experience directed toward the development of a good citizen.

The Teacher

LE	PE	TE	The middle school teacher . . .
			Establishes a creative learning environment for early adolescents
	1	2	Supports the guidance and counseling services
			Implements variable groups--large/small, multiage, alternative, etc.
	3		Utilizes team planning and team teaching
11.5	11	11	Establishes a climate of student freedom and self-directed learning
2.5			Provides for, insists upon, and is accountable for student academic achievement
1	2	1	Assumes a variety of teaching roles--facilitator, manager, resource, etc.
2.5		3	Utilizes a variety of instructional techniques--peer teaching, simulations and games, inquiry, etc.
			Communicates effectively to parents concerning the child's performance in the school program
11.5	13	13	Participates in state and national meetings and conferences
13	12	12	Applies the findings of educational research to classroom teaching
			Works to design learning activities and strategies to meet the diverse learning styles of the students
			Establishes a climate of classroom discipline and teacher-directed learning

The Principal

LE	PE	TE	The middle school principal . . .
11	11	10	Participates in school board decision making processes
12	12	11	Utilizes management principles based on systems design
	2		Provides instructional leadership in middle school programs
10			Employs teachers trained in teaching early adolescents
	3		Possesses previous teaching experience in middle or junior high schools
			Develops and controls the budget for his school
		3	Provides a system for parent input on a regular basis
3			Employs or has the final decision in the employment of faculty/staff
	10	12	Involves teachers in the selection of faculty/staff
1.5		1	Participates in state and national meetings and conferences
			Applies the findings of educational research to school administration
1.5	1	2	Utilizes staff in solving school problems

The Curriculum

LE	PE	TE	The middle school curriculum . . .
	2	2	Requires depth, breadth and sequence in subject matter
1	1	1	Continues the development and refinement of basic skills
10			Focuses on competencies as the basis for curriculum design
3	3		Encourages a proportional balance between subject matter and exploration in elective areas, the fine arts, and career education
		3	Provides for varied and continuous progress in subject matter
11	10	11	Establishes specific classes for all types of exceptional children
			Considers both child-centered and subject-centered concerns in a balanced curriculum
2			Encourages participation in activities--clubs, student government, dramatics, recreation, etc.
			Focuses on humanistic concerns as the basis for curriculum design
			Provides for mastery achievement in skills and concepts
	11	10	Provides for exploration and training in career education
12	12	12	Focuses on the core curriculum concept as the basis for curriculum design

Facilities and Organization

LE	PE	TE	Regarding facilities and organization, the middle school . . .
7.5	8		Provides for homogeneous or ability grouping
	3	2	Provides for team teaching
7.5			Establishes flexible/modular scheduling
10	10	10	Maintains the self-contained classroom for grades 5 and/or 6
9		8	Provides for transition between the self-contained classroom and departmentalization
	9	9	Introduces departmentalization at grades 5 and/or 6
			Fosters alternative school programs to meet the needs of students
2	2	3	Encourages developments in individualized instruction, independent study, learning centers, and the like
3			Requires a building permitting flexible, multi-purpose utilization
1	1	1	Broadens the program to include shops, labs, and special enrichment classrooms

PRIORITIES OF NEEDS, COMPETENCIES AND TRAINING OF MIDDLE GRADE TEACHERS

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Introduction

The growing literature on early adolescence clearly suggests the need for specialized training for those professionals who work with the 10-14 year old age group (Lipsitz, 1977; NSF, 1978). The significant biological, emotional and cognitive changes which occur during those years make it imperative that the teachers of these youngsters have a solid foundation in the nature of development at puberty.

If one accepts the need for specialized training for teachers of early adolescents as well as the reality, that much of teaching competency is developed or refined after the initial undergraduate preparation, the interaction of in-service and the natural accumulation of on-the-job experience becomes an important issue. These factors coupled with the growing concern within the profession for teacher burnout and the fact that generous amounts of time and money are spent on staff development, investigation into the in-service training of teachers is warranted.

Furthermore, since the authors of this study accept the premise that that in-service is most effectively developed if based on the perceived needs of the teachers involved, they undertook this preliminary investigation of teacher need relative to proficiency. Teachers were questioned as to which competencies they perceived necessary for effective teaching, how proficient they perceived themselves to be in these competencies, and, finally, where they believed these proficiencies had been developed (if indeed they had been developed).

Instrumentation

The competencies used in this study were generated by Bowling Green University to evaluate its teacher education graduates (1978). From that test, fifteen competencies representing the areas of the Teacher Performance Assessment Instrument formed the basis of the questionnaire used in this study. (The TPAI is the on-the-job assessment instrument developed by the State of Georgia to evaluate beginning teachers for certification purposes.) FOOTNOTE THIS.

The teachers were asked to respond to all the competency statements in three ways: need for the competency, their proficiency in the competency area and where the proficiency was developed. Table I shows the response format of the questionnaire.

Table I

Teacher Questionnaire Response Format

NEED - What is the extent to which this competency is needed by you in your classroom situation?

1. Not applicable
2. Not needed
3. Little
4. Moderate
5. Extensive

PROFICIENCY - What do you consider to be your proficiency concerning this competency?

1. Not proficient
2. Limited
3. Adequate
4. More than adequate
5. Extensive

WHERE DEVELOPED - Where do you feel this competency was developed?

1. Not developed
2. Developed at undergraduate teacher education institution
3. On-the-job work experience
4. In-service
5. Independent study

Sample and Procedures

The sample in this study was comprised of two groups of practicing teachers. The responses of a group of middle school teachers were compared with those of a second group of elementary and secondary teachers.

The latter group included fifty-one elementary and secondary teachers from a county, public school system in a mid-sized city in the southeastern part of the United States. The teachers in this sample represented twenty-nine different undergraduate teacher preparation institutions in eighteen states.

The middle school group was comprised of teachers from four counties in the greater metropolitan area in the southeastern United States. All of the teachers sampled were currently teaching in middle schools within their four respective county school systems. These schools represent a variety of developmental stages in the implementation of

middle school programs within their counties. These teachers represent an even more varied geographical representation in their undergraduate work than do the comparison group.

The questionnaire was distributed to the teachers either by a curriculum director or a principal upon the request of the authors of this study. The teachers were asked to fill out the questionnaire partially for the purpose of fulfilling the study itself but also for the purpose of generating assessment feedback which was viewed as being useful for their respective counties in designing staff development. Two hundred four of these middle school teachers completed and returned the questionnaire.

Tables and Results

Table II lists the teacher competencies, the mean score and rank for both need and proficiency as indicated by the two groups.

Table II

Teacher Competencies	Elem-Secondary (N=51) Need Mean	Need Rank	Proficiency Mean	Proficiency Rank	Middle Grades (N=204) Need Mean	Need Rank	Proficiency Mean	Proficiency Rank
Ability to construct performance/ behavior objectives in your particular subject area.	3.764	7	3.411	7	3.922	12	3.663	11
Ability to apply evaluative techniques appropriate to the student and classroom situation.	3.843*	5	3.333	10	4.415	1	4.045	3
Ability to interpret and report student performance on teacher-made tests.	3.607	11	3.627	3	4.405	2	4.088	2
Ability to maintain order in a classroom and to assist students in the development of self-discipline.	4.039*	1	3.392	8	4.388*	3	3.960	4
Ability to individualize instruction to meet the varing needs of students, via techniques such as mastery learning, alternative assignments, individual contracting, and group work.	3.901*	3	3.039	14	4.340*	6	3.655	12
Ability to utilize audiovisual equipment and materials in teaching.	3.647	9	3.450	5	4.150	9	3.898	5
Ability to prepare teacher-made tests.	3.627	10	3.666	2	4.275	7	4.150	1
Ability to encourage and facilitate the development of social skills and enhanced self-concept.	3.882	4	3.352	9	4.385	4	3.863	6

Table II (continued)

Teacher Competencies	Elem-Secondary (N=51) Need Mean	Need Rank	Proficiency Mean	Proficiency Rank	Middle Grades (N=204) Need Mean	Need Rank	Proficiency Mean	Proficiency Rank
Ability to motivate student achievement via modeling, reinforcement, provision of success experiences, and appeal to student interests.	3.940*	2	3.312	11	4.368*	5	3.788	7
Ability to continue the development and clarification of one's own philosophy of education.	3.686	8	3.431	6	4.135*	10	3.768	8
Ability to provide instruction leading to the different cognitive goals of acquisition, comprehensive, and application to knowledge.	3.823	6	3.823	1	4.215*	8	3.692	10
Ability to interpret and report student performance on standardized tests.	3.588	12	3.470	4	3.703	13	3.558	13
Ability to utilize an understanding of the formal chain of control, decision making, communication, and authority within each school unit and their effects upon the daily operation of the classroom.	3.490	13	3.215	12	4.018	11	3.735	9
Ability to understand the role of teacher organizations with the formal and informal competition for control of education and one's own personal role in joining or not joining such organizations.	3.196	15	3.078	13	3.145	15	3.125	14

Table II (continued)

Teacher Competencies	Elem-Secondary (N=51) Need Mean	Need Rank	Proficiency Mean	Proficiency Rank	Middle Grades (N=204) Need Mean	Need Rank	Proficiency Mean	Proficiency Rank
Ability to apply the basic principles of how schools are financed, sources of income and major areas of expenditure, and how these factors directly affect classroom operation.	3.313*	14	2.70	15	3.290	14	3.023	15

*Significant difference between need and proficiency.

Table III indicates the relationships between perceived needs and proficiencies for Middle School Teachers and Elementary-Secondary Teachers.

Table III

	Middle School Needs	Middle School Proficiency	Elem-Secondary Needs
Middle School Proficiency	.894*		
Elem-Secondary Need	.870*	.632	
Elem-Secondary Proficiency	.505	.575	.528

*Significant .05

Table IV reports t-test analysis of Middle School Teachers and Elementary and Secondary Teachers' need and proficiency.

Table IV

	Elem-Secondary Need	Elem-Secondary Proficiency
Middle School Need	t=3.246*(.003)	
Middle School Proficiency		t=3.106*(.004)

Table V includes the average percentage of each group's perceptions as to where the proficiencies were developed.

Table V

	Undergraduate Institution	Work Experience	Other
Elem-Secondary	32%	45%	23%
Middle School	19%	62%	19%

Discussion of Results

Introduction

The data analysis indicates a high correlation between perceived teacher needs and proficiency in the competency areas represented by objectives 4, 5, 9, 10 and 11 among the

middle school sample but not among the comparison group. This suggests that the middle school teachers in the study were both more sensitive to the kinds of competencies needed for effective teaching and felt more proficient in these competencies. Both phenomena, the expressed need and the perceived proficiency, were hypothesized to be the result of the administrative support and direction (e.g., orientations, workshops, curricular organization, etc.) within their middle schools. However, the middle school teachers disagreed with the authors' hypothesis. They themselves claimed that on-the-job experience accounted for their proficiency.

It was also hypothesized that the middle school teachers would rate discipline as the highest priority need in teaching. The data showed that while the teachers did rate it among their higher priorities, they did not rate it the highest priority need as did the comparison group, thereby negating the authors' second hypothesis. The data resulting from the study is interpreted more closely in the following discussion to explore the possible reasons for the rejection of both the hypotheses.

Experience in Teaching as a Factor in the Study

First, the authors do not believe that the difference between the responses of the middle school and the comparison groups on the five objectives identified above can be attributed to a difference in average years of teaching. While the middle school teachers have been teaching longer, an average of 7.54 years as compared with an average of 5.84 years for the comparison group, the average difference of 1.7 years does not appear sufficient enough to account for the significant difference in the outlook of the two groups. This would especially seem to be true after about five years of teaching. That is to say, if the average difference in years of teaching occurred during the first three years of classroom teaching when much of the adaptation of teachers to the classroom environment takes place, it could much more readily be diagnosed as a factor accountable for some of the difference in teacher attitudes. A difference of 1-2 years in experience after 3 or 4 years of teaching could not alone account for the variation in teacher outlook.

Clarification of In-Service

The reasons for the differing views between the two groups in this study must be found elsewhere. The obvious factor present in each of the middle school settings to a much greater degree than in those of the comparison group is that of in-depth staff development. This in-service education has taken many forms and has been both general to middle grade education and specific to the curricular settings of the individual schools and systems. The staff development

was undertaken deliberately to facilitate effective teaching, teacher morale, and student growth.

However, the middle school teachers themselves attributed their proficiency to on-the-job learning, not in-service! This discrepancy between the hypothesis of the authors that the formal and informal in-servicing is chiefly responsible for teacher proficiency and the interpretation of the teachers themselves that on-the-job experience not in-service was largely responsible can be explained quite simply. Both interpretations are merely different perspectives of the same phenomena or different ways of interpreting what is meant by staff development.

What the middle school teachers saw as on-the-job experience in the settings where they work, is closely intertwined with informal staff development. Since the administrators of the middle schools in the study are committed to middle grade education, they have organized curricular environments which themselves are a kind of in-service but which the teachers themselves would <u>not</u> necessarily lable as such when asked to do so.

The following are examples of what is meant: in the schools core programs and teaming are organized and encouraged; the counselors in these middle schools perceive themselves as resource persons and leaders of advisor-advisee or counseling programs and guide the teachers in working with student; teachers are given an orientation to the school/county curricula and to middle grade and early adolescent education in general; personalized education is encouraged through media and county-wide assistance from curriculum personnel and media experts, etc. Overall, the implementation of what are usually categorized as "innovative" practices geared to the developmental level of the students are supported by the school administration and the teachers are given guidance and instruction in managing these programs/practices.

This interpretation would account for the high correlation between perceived need and proficiency, as expressed by the middle school teachers themselves. They developed their heightened awareness and proficiency on-the-job, this is true, but the very nature of the curricular settings in which they were working, interacted with and maximized to a greater degree the "natural" accumulation of on-the-job experience than was true for the comparison group. This nurturant environment could have caused the middle school group to mature professionally both more quickly and somewhat differently from the comparison group of elementary and secondary teachers.

Discussion of Objectives 4, 5, 9, 10 and 11

A discussion of each of the five competency areas for which the data analysis revealed a significant correlation between perceived need and assessed proficiency follows. This discussion will further explore the reasons for the difference between the responses of the middle school and the comparison group.

Objective four of the questionnaire addresses the need for maintaining effective classroom management and encouraging student self-discipline. Almost all student teachers, new teachers and many veteran teachers invariably cite discipline as their major teaching concern. Therefore, the ranking of this objective both by the middle school and the comparison groups as the one of the higher priority needs for teaching was not surprising.

What was surprising was that while the comparison group ranked classroom management as the highest priority need, the middle school teachers ranked this need third to fourth on an average. The reasons to explain this are probably two-fold. First, by their nature, the middle school curricula are more responsive to the needs of early adolescents and more representative of effective teaching practice as judged either by the Teacher Performance Assessment Instrument or the general literature on effective teaching. Therefore, it is suggested that the students in these schools may feel less of a need to act out frustrations brought about by poor teaching and curricula. Discipline may not be as much of a problem because it is addressed in a before-the-fact or preventive manner.

Secondly, the orientation to middle school teaching given these teachers includes some input about the nature of the early adolescent. This understanding of the developmental stage has been shown to be effective in changing teacher attitudes toward what is "normal" versus what is unacceptable student behavior. This would account for the fact that the middle grade teachers did not perceive classroom management as their highest priority need. It could also account for the high correlation between the perceived need and level of competency. Quite simply, due to the middle school curriculum organization, there may not be as many discipline problems in the eyes of the teachers. Freed from concerns about discipline, these teachers could focus on other needs.

The high correlation between perceived teacher need and level of proficiency for objectives 5, 9, 10 and 11 can also be explained on the basis of their relationship to what the literature views as effective middle school practice. The need to individualize instruction is clearly emphasized in the literature as a response to the differences which

characterize middle school students (Lounsbury, 1979; Curtis & Bidwell, 1977). Recognizing this, the in-service activities of the schools in the study have included training and support for efforts to individualize instruction.

That the teachers saw both need and proficiency in the area of ability of student motivation (objective 9) can be explained in a similar manner. Motivation is seen as a function of a positive match between student needs and curriculum. A curriculum which is suited to the developmental stage of the students will be a motivating one (Bidwell, 1978). Examination of the curriculum structure and in-service activities of the middle schools in the study reveals a concern for individualization, as discussed above, and therefore a concern for student needs.

That the middle school teachers expressed a concern for the cognitive development of their students (objective 11) is also understandable. Toepfer's research on brain growth periodization is familiar to many of these teachers. Toepfer himself has been actively involved with them in heightening their awareness of how to assess concrete versus abstract thinking and to adapt curriculum to the students' level of cognitive development. Therefore, when the teachers expressed awareness of the need to adapt teaching to the cognitive development of their students, they were reflecting what they had learned from the in-service activities with which they had been involved.

Finally, the high correlation between teacher assessed need and proficiency with reference to developing one's philosophy of education (objective 10) can be explained in a like manner. The kinds of in-service activities previously mentioned for the most part (with the exception of the how-to workshops) challenge the teachers to reassess their beliefs about what is acceptable behavior, what are appropriate learning activities, how does one <u>really</u> evaluate student progress, etc. They are all facets of reorganizing one's belief system or philosophy about teaching, learning, schooling, etc.

One other point about the objectives which the middle school teachers prioritized higher than classroom management concerns is worthy of discussion. As a group, the middle school teachers rated some combination of objectives 2, 3, 7 and 12 (evaluation and testing) as top professional concerns. This has been interpreted in light of the results previously discussed to mean that the middle school teachers, by virtue of the graduate work and the formal and informal in-servicing they received during their teaching, were able to move away from "I" concerns about managing groups of people to more sophisticated concerns about student growth, of which evaluation is one.

Frances Fuller has hypothesized that as teachers grow professionally, they develop from concerns about self to concerns about students (Hall, 1979). The fact that by their own admission, the middle school teachers have been able to grow as educators beyond the point of the self-oriented concerns of the comparison group may be an endorsement of the success of the middle school programs in the study at least in terms of teacher growth.

Summary and Conclusions

In summary, the interpretation of the data gathered in this study may add some interesting and possibly significant findings to the growing literature on middle grade education. The conclusions drawn from this preliminary inquiry certainly pose some questions worthy of further investigation by educators concerned with teacher training in general. First, in what ways might the environment of the middle school contribute to teacher growth. Further clarification of this issue seems warranted by virtue of the variation in the level of concerns between the middle school teachers (concern for evaluation, cognitive development, etc.) and the comparison group (concern for discipline). Investigation of this question could be important in minimizing teacher burnout. However, the literature on the adoption-adaption process in education clearly points to the need for caution when drawing inferences about any facet of the change process in education, and changing teachers in particular (Newlove and Hall, 1979).

Second, if some factors in the environment of middle schools can be identified as contributing to teacher growth rather than burnout, the question of how to insure the presence of the factors could then be addressed. Such an investigation would be valuable for teacher renewal in all schools, not only middle schools. As an aid in the inquiry, an instrument which would clarify the confusion between the "in-service" and "experience" elements in this study might be helpful in clearing up the discrepancy between how the teachers believed they developed their competency (on-the-job) and the authors' conclusions (in-service).

Finally, the fact that the middle school teachers in this study relegated the need to know how-to-discipline to a less than highest priority need may be worthy of further study. This information could be of value to those middle school proponents who are searching for evidence to demonstrate to their public the validity of middle grade education.

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TRANSITION TO A MIDDLE SCHOOL: A STUDY OF CHANGE

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INTRODUCTION

The present paper reports a study which was conducted in a Hillsborough County, Florida, school, during transition from a seventh-grade center to a middle school (grades six and seven combined). The Hillsborough County School System is the 27th largest district in the United States and contains substantial numbers of minority group children (black, Hispanic-Cuban, inner city). This newly created "West Tampa Middle School," was the first middle school established in this county, and as such presented a veritable laboratory for study of some of the primary factors responsible for, and characteristic of, an important change process as it occurred in a local school setting.

OBJECTIVES - PURPOSES (Research Questions)

More specifically, the objectives of this paper are:

1) Demonstrate the usefulness of a naturalistic-like inquiry approach to the study of an on-going change process in education.
2) Illustrate the mutually complimentary relationship possible between preordinant measurement approaches to data gathering, and the openness posture of a naturalistic orientation.
3) Understand and describe the theoretical concept of a "middle school" as formulated by early decision-makers and planners at West Tampa.
4) Recount the sequence of essential events or considerations leading to the decision to establish a middle school at West Tampa.
5) Study the implementation process, focusing upon a tracing of significant change impact upon key personnel.
6) Identify and measure existent attitudinal, achievement parameters of principal participants and subjects.
7) Establish possible links between observed change processes and measured variables.
8) Suggest directions for continued study in order to increase understanding of the change phenomenon itself, identify possible outcomes associated with observed changes, and further validate the important links or connections suggested earlier.

SURVEY OF RELEVANT LITERATURE

After twenty years of existence, the middle school has firmly established itself as a legitimate and acceptable model of intermediate education in the United States. We now have more middle schools by name than junior high schools in the United States.

In the past ten years, research studies have attempted to evaluate the effectiveness of the middle school according to a variety of criteria. Most

of the research has been comparative in nature, assessing the middle school in relation to other forms of intermediate education.

The authors have identified a total of fifty studies on the middle school. Of that total some twenty have been found to be substantial in terms of research design, number of subjects assessed, and usable findings. Most of the studies have been the result of dissertation studies by middle school or junior high school advocates. For this reason alone, the objectivity of such studies is questionable. Another area of concern is that existing research comes from a limited number of states and regions in the United States. Florida, Pennsylvania, Michigan, and New York are areas where a majority of research studies have been completed. A final area of concern is that existing research on the middle school focuses on just four areas: academic achievement, attitudes, self-concepts, and facilities.

Studies of achievement have compared academic achievement in middle schools to such achievement in other forms of intermediate education. These studies (Mooney, 1970; Case, 1970; Howell, 1969) found no significant differences in achievement for middle schoolers when compared to equivalent students in other forms of intermediate education.

Two kinds of attitudes were addressed by studies reviewed: attitude of students toward school and attitudes of teachers and parents toward the middle school. Wood (1973) found no significant differences in student attitudes toward school. Ellie (1970), Schoo (1970), and Bryan and Erickson (1970), found a significant difference in the positive attitudes middle school students had toward school. Trauschke (1970) and Howell (1969) found a significant difference in the positive attitude of teachers toward school in middle schools.

In the area of self-concept among students, four studies (Case, 1970; Eholich and Murray, 1969; Ellie, 1970; and Trauschke, 1970) found no significant difference between middle school students and control students studied. Schoo (1970), and Soares, Soares and Plumerantz (1973) found lowered self-concepts of middle school students when compared to other forms of intermediate education.

Three studies have looked at facilities (Davis, 1970; Gatewood, 1970; and Russell, 1976). No significant differences were found in facilities of middle schools and other forms of intermediate education.

Moeller (1979) conducted an important study to identify middle school programmatic characteristics. More studies are needed in identifying those qualities which are distinctive to middle school education.

J. Howard Johnston and others at the University of Cincinnati (1980) have recently completed a delphi study to determine needed middle school research. They, and Wiles and Thomason (1975), agree that there is still a paucity of good middle school research. The middle school movement has reached the point where empirical investigations of its practices are needed.

DATA GATHERING AND ANALYSIS PROCEDURES

Methodologically, the present study accepted a responsive or "open" stance. Particular methods of systematic study adopted depended upon the

objectives to be served. For example, a social process "trace," germane to capturing the essence of an interactive, developing pattern of human or institutional relationships, was not rejected because of its failure to conform to the demands of some a priori program evaluation or experimental design model. Neither was the measurement of variables for groups, at fixed points in time, viewed as intrinsically inconsistent with efforts to gather and use less quantitative, observational data, collected through the trained skills of a human observer. Methods were subordinated to the type of data needed and the purposes for which these data were to be used. This generally defined the responsive methodological base from which the present investigation was conducted.

The need for openness in approaches to the systematic study of education appears almost self-evident. Summative evaluations of something called "educational programs," where terminal, product, outcomes are measured, and comparisons are made between competing programs, have generally left many important questions unanswered (Gephart and Potter, 1976; Stephens, 1967). Even in the few cases where practically significant differences have been established, the actual mechanisms whereby the measured outcomes have been attained, remain largely obscure (Rutman, 1977). Understanding these vital links between process and product requires quite simply that the unfolding process itself becomes a subject for more rigorous study.

In the case of new or revised educational programs, confirmation that introduction of the innovation is associated with observable institutional or individual change is a prerequisite to identifying and understanding significant consequences of this change. With such data, the observed consequences become more than isolated outcomes noted after termination of the program; instead, they become naturally evolving consequences of the total process represented by the program. This process itself will have been traced and so the link between this process and observed outcomes is describable and accessible. Methodological openness is particularly important so that naturalistically oriented approaches, derived from procedures long established in other social sciences, can contribute in this way to the advancement of knowledge about education.

Specific methods employed included the following:

1) Ex post facto analysis of the decision-making process, using historical documents and interviews with participants.
2) "Investigative Journalism" techniques in isolating the main dimensions of middle school philosophy at West Tampa.
3) Observation of naturally occurring, interactive behavior by subjects in professional settings.
4) Construction and administration of inventory instruments designed to assess attitudinal parameters characterizing principal subjects at particular points in time.
5) Analysis of available pupil achievement data.

DATA SOURCE (Sampling Techniques)

The primary data source was of course the human subjects involved in the emerging West Tampa Middle School, including school administrators, curriculum advisors, teachers, pupils and parents. For those groups studied,

the total population at West Tampa was included. Since the immediate purposes of this inquiry did not include generalization to any other groups, questions of statistical significance were irrelevant, even where quantified data were reported.

Documents, both past and present, represented a second data source. These included official publications, formal memorandums, teacher-prepared materials, and pupil reports. Test results, representing performance on both teacher-made and standardized measures, were used as available. Products or notes of earlier meetings were also examined.

FINDINGS

The principal findings of this investigation are listed and briefly discussed below.

1) The initial decision to install a middle school was largely an administrative one, made in response to existent societal-community factors, essentially unrelated to any philosophical-psychological rationale. Pressures of declining enrollments and significant resistance to the threatened closing of neighborhood schools were decisive.

2) Once having made the decision to combine both grades in one school, movement to describe the educational characteristics logically connected with middle schools, both as a rationale for organizing a middle school, and as a set of guidelines for determining curriculum and in-service teacher preparation needs, quickly followed. It is perhaps worthwhile to focus briefly upon these, for taken together they represent in some sense the set of ideal specifications and objectives adopted for the West Tampa Middle School. In this sense, they are perhaps the clearest theoretical blueprint initially offered for implementation of a middle school at West Tampa.

   Theoretically a curriculum consistent with, if not premised upon, the developmental needs of preadolescents has been largely endorsed. Acceptance of certain other salient characteristics of middle school organization and policy was also evident in the following articulated elements:

   a) Interdisciplinary teaching and planning.
   b) Instructional activities sensitive to the needs and interests of individual students, and relevant to their experiences and concerns.
   c) Articulation of the various subject matters across the grade levels involved (here sixth and seventh grades).
   d) Sufficient allocation and flexibility of time, space and materials to permit adequate implementation of the above elements.

3) Significant or perceived change has occurred at two levels. First, the organization of the school has obviously changed to include two

grade levels instead of one, with concomitant changes necessary in certain administrative arrangements, and in pupil and teacher schedules. Second, teacher behavior has been clearly impacted in one area: teacher planning activities. With some exceptions, little evidence exists that substantial alteration has resulted in teachers' actual instructional strategies within their own classrooms, or in their perceptions of important pupil learning objectives.

Responses to a specially constructed instrument, Teacher Perception Inquiry (TPI), indicated clearly that the impact of the "middle school" decision at West Tampa upon the perceived professional activities of the teachers themselves was minimal, as of February, 1980. Each subject was asked to propose five pupil learning objectives which were judged to be of central importance in conducting present classroom instruction. Subjects were then asked to characterize each of the five proposed objectives as either of central importance or not of central importance in their instructional activities before involvement in West Tampa as a middle school. Of 55 objectives proposed by teachers as centrally important in classroom instruction, only one of these objectives became of central importance during or after their involvement in the middle school transition. In other words, 54 of the 55 most important objectives were not associated with middle school involvement, but were viewed as a regular part of their instructional activities before participating in middle school activities. Teaching strategies or in-class instructional techniques were similarly perceived as reflecting little or no impact as a result of middle school change.

4) Measurement data suggested the coexistence of generally favorable teacher and pupil attitudes toward the West Tampa experience. No causation can be suggested; however, clearly the potential for the change process to generate positive reactions among teachers and students was established. Positive responses to questions regarding their professional experiences at West Tampa were observed. Percentages of favorable responses were generally around 70% with a range from 56% to 85%.

5) Achievement test data suggest pupil performance was at a reasonable mastery level on teacher-made tests, and was not significantly above or below average on standardized measures. For example, the expected grade equivalent scores, and the attained grade equivalent scores of pupils at West Tampa on the Comprehensive Test of Basic Skills, Form 5, Level 3, are shown in the following table.

Area	Expected	Attained	Difference
Reading	7.2	7.4	+.2
Language	6.9	7.0	+.1
Math	7.5	7.4	-.1
Total Battery	7.2	7.3	+.1

Furthermore, 70% of the students showed 80% or better mastery of material taught in a special interdisciplinary unit of study.

CONCLUSIONS AND IMPLICATIONS

Illustration of the effective use of a responsive, naturalistically oriented methodology, blended with collection of relevant quantitative measurement data, to study the evolution and early development of an important new educational program probably summarize the central importance of this study. Methods of data collection and analysis were decided upon in close interaction with the purposes of the study, and were also modified in the light of newly emerging information about the program itself.

Useful information regarding not only the particular educational change being implemented, but also the utility of the particular methodological approach followed should be among the products issuing from this study.

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Middle and Junior High School Students' Attitudes Toward Family Influences and Generational Differences: A Comparative Study

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There has been the prevalent feeling that there are significant generational differences between children and parents. This idea was popularized in the 1960s by the media and numerous research studies tested the idea, most with mixed results. Most 1960s research was conducted among college students. Throughout the 1970s interest in this topic diminished as popular rhetoric led us to believe that youth were returning to conservatism.

The 1960s and 1970s yielded few studies among adolescents. To the best of our knowledge there were no studies conducted among early adolescents. During these same time frames little research was conducted on the nature of family relationships. At the same time popular rhetoric repeatedly suggested that the family was disintegrating. The ideas that adolescents are becoming more conservative, yet the family is disintegrating seems to be incompatible ideas, at least on the surface. This is one motivation for doing this study--to see the social perceptions held between children and parents. The second primary reason for the study is that we have no data base for drawing inferences about early adolescent-parental relations. There simply is no precedent here. By beginning to investigate this problem now we may have a better basis to discuss such issues and to put into an historical context say by 1990.

In order to study social perceptions of the family there are two dimensions specifically theorized for this study. First, we believe a measure of generational differences provides some basis for discussing if and to what extent a "gap" exists. Second, we believe a measure of the early adolescent's ability to influence a parent is an important aspect of their social relationship. Keeping these two dimensions in mind the following null hypotheses were formulated:

1. There will be no significant generational differences perceived by early adolescents and parents as measured by the Generational Differences Scale.

2. There will be no significant generational differences between early adolescents and parents when considering the independent variables

of age, sex, school organization, grade in school, parental structure, and ethnic membership as measured by the Generational Differences Scale.

3. There will be no significant differences in attempts to influence parents between early adolescent males and females as measured by the Influences on Others Scale.

4. There will be no significant differences in attempts to influence mother more than father by early adolescents as measured by the Influence on Others Scale.

5. There will be no significant differences in attempts to influence parents by early adolescents when considering the independent variables of age, school organization, grade in school, parental structure, and ethnic membership as measured by the Influence on Others Scale.

There is one additional relationship we desired to look at although it is not truly a hypothesis. However, we would conjecture that the greater the perception of early adolescents of generational differences the less they would perceive they could influence either or both parents.

Sample. There were four schools in the sample. School one was a middle school (6-8) on a military base (N=342). School two was a middle school (6-8) in a large city (N=442). Schools three and four were desegregated junior highs (7-8) in a large city (N=180; 414). All students at each grade level were sampled.

Instruments. The Generational Differences Scale and the Influence on Others Scale were both originally constructed for this study. Three constructs were generated prior to developing the Generational Differences Scale, namely: (a) Listening. This construct means to what extent early adolescents feel their parents listen to them. There are five items which test this construct. One example is "Most adults do not really listen to people my age;" (b) Understanding. This construct is designed to determine to what extent early adolescents feel their parents understand them. Five items measure this construct. An example is "Adults really try to understand people my age;" and (c) Experience. This construct is designed to see if early adolescents perceive that parental experience is a significant variable in generational differences. One of the five items measuring this construct is "My parents do not realize how different things are today than when they were my age." The 15-item Generational Differences Scale has a reliability of .79 .

The Influence on Parents Scale was constructed differently. Situations which have the potential of coming up within the normal living patterns of the family were included in the scale. An example is "My father watches television programs that I suggest." There are two distinct subscales in this questionnaire. They are identified simply as "Mother" and "Father" subscales. Each subscale is 15 items; the total scale is 30-items. Reliability for the Father Subscale is .76; the Mother Subscale is .75; the overall reliability on the Influence on Parents Scale is .86 .

The items on the Generational Differences Scale and the Influence on Parents Scale were randomly assigned. Subjects responded on a six-point scale: Strongly agree, slightly agree, agree, disagree, slightly disagree, and strongly disagree. Independent variables included age, sex, ethnicity, grade in school, organizational structure, and family structure. Questionnaires were administered in all schools by classroom teachers as a regular part of their school day.

Data were analyzed by SPSS. Analysis of variance and covariance were used to account for main and interaction effects. Subroutines were run to accommodate for reversal items. In addition, questionnaires containing 20 percent or more blanks were deleted from the analysis. Correlations were determined by the Cronbach alpha formula.

Results. There are two overall findings of particular interest in this study. First, given the percentages of agreement with attitude statements on the Generational Differences Scale it does not appear that today's early adolescents perceive that there is a generation gap. The total agreement with statements, which would indicate no gap, was 63.1 percent. Table 1 summarizes the percentage agreeing with each item by total and by each of the four groups in the study.

To explore hypothesis two, analysis of variance was run. When testing for differences between groups an F-ratio of 4.60 was derived, significant at the .003 level. Examination of per item means and the percentages reported in Table 1 indicate that group two, a large city middle school accounted for the difference. This school is predominately Anglo (69%) and is middle to upper middle class. The fact that these early adolescents perceived less generational differences than the other schools is an interesting finding, especially in light of the fact that it was among this class structure where the greatest gap was found in the 1960s.

Two other independent variables were significant, age ($F = 8.35$, $p < .001$) and grade ($F = 13.5$, $p < .001$). As early adolescents become increasingly older, perceived generational differences became increasingly greater. Thus, 14 year olds indicated a greater gap than the 11, 12, and 13 year olds. Similarly, eighth graders perceived more gap than six and seventh graders. No differences were found when testing for sex, ethnic, and family structure differences.

Our second major overall finding is that early adolescents do not perceive that they can influence their parents in a variety of normal activities. On a six-point scale the average per item mean of all groups combined was 4.1 . The closer an item is to 1.0 the greater the perceived influence. When looking at the relative influence early adolescents think they have on parents, there were marked differences. The per item mean on influence on mother was 4.0 compared to 4.15 on father. All four groups and both sexes tended to influence their mothers more. The lower the overall percentage the less an individual perceived an ability to influence parents. As can be observed in Table 2, all percentages were high leading us to conclude that little influence was exerted.

Table 1

Percent of Early Adolescents Indicating Generational Differences

Item	MS-1 (N=349)	MS-2 (N=432)	MS-3 (N=164)	MS-4 (N=374)	Total (N=1319)
1. Most adults don't really listen to people my age	40.3	50.3	42.9	38.5	43.4
2. Adults don't even want to listen when a person like me tries to explain problems	50.4	65.3	60.4	59.0	59.2
3. I like to listen to my parents	68.6	73.5	66.3	67.0	69.5
4. My parents listen to me when I have something to say	76.7	80.3	82.2	76.4	78.5
5. Teenagers should pay more attention to their parents	76.4	77.6	74.4	74.8	76.1
6. I don't understand the way adults think	38.4	54.4	49.7	47.2	47.5
7. Adults don't understand what's going on today	58.7	64.3	54.3	61.5	60.8
8. Adults really try to understand people my age	55.5	66.5	66.5	57.3	61.1
9. My parents really don't try to understand me	78.1	81.2	82.8	78.4	80.3
10. Most adults do understand people like me	58.8	64.3	63.4	62.3	62.1

Table 1--Continued

	MS-1 (N=349)	MS-2 (N=432)	MS-3 (N=164)	MS-4 (N=374)	Total (N=1319)
11. My parents don't realize how different things are today than when they were my age	36.7	49.4	39.5	41.2	42.5
12. The way my parents look at things makes a lot of sense	64.1	74.1	73.8	71.4	70.7
13. Because adults have lived longer they judge things better than people my age do	59.4	65.1	62.6	59.5	61.7
14. My parents know what's happening in the world today	81.8	81.0	79.3	79.0	80.3
15. Adults live too much in the past	48.6	56.0	44.8	54.6	52.2
Totals (percent)	59.5	67.1	62.8	61.9	63.1

Table 2

Percent of Early Adolescents Indicating Attempts ot Influence Parents

Category	MS-1 (N=349)		MS-2 (N=413)		JH-1 (N=164)		JH-2 (N=374)		Total (N=1319)	
	M*	F	M	F	M	F	M	F	M	F
Alcohol	42	46	39	36	33	40	37	35	38.0	38.3
Family Activities	54	40	62	57	52	41	56	43	56.0	45.7
Friends	17	8	22	21	19	17	23	17	20.3	15.6
Household	31	33	26	23	27	23	27	31	27.4	27.6
Inexpensive item	48	37	43	37	45	41	42	36	43.7	36.7
Looks	39	18	37	23	42	20	37	21	37.6	20.4
Movies	18	12	33	31	38	25	36	26	30.0	23.4
Reading	42	35	49	43	44	33	50	37	46.1	37.3
Recreation	58	44	60	54	64	48	55	51	57.7	50.0
Relationship	28	22	33	30	33	27	27	27	29.5	26.2
Religion	24	15	31	24	25	17	26	18	26.5	18.7
Television	30	22	39	34	42	28	37	31	35.9	28.7
Tobacco	44	46	34	37	30	29	38	39	36.8	38.4
Vacations	36	46	29	38	35	39	38	43	33.7	41.1
Vote	20	15	23	18	17	13	17	17	19.4	16.0
Total	35	29	37	34	36	29	36	31	35.9	30.9

*M=mother; F=father. A copy of the Scale is available from the senior author.

When testing for group differences, school one, the military base school, students indicated less ability to influence parents than the other three groups of students did. Their overall mean scores were significantly different at the .0004 level ($F = 6.20$). When looking at sex differences in attempts to influence parents, females indicated stronger attempts on their fathers than males ($F = 6.86$, $p < .009$) although there were no sex differences in attempts to influence mothers. In contrast to the findings on the Generational Differences Scale, there were no differences in attempted influences by grade level and age.

In order to address one underlying interest we would like to discuss the relationship between the two measures, generational differences and influence on parents. Not having any other studies for comparison or perspective is a limitation in knowing more precisely how to interpret some of our results. There are two apparent trends, however. First, it does not appear that generational differences are felt by most of the early adolescents in this study. Second, it does not appear that early adolescents perceive they can influence their parents. The diversity of our sample and the reliability of the instruments lead us to believe that these findings are valid.

It may seem that an inability to influence might lead early adolescents to perceive generational differences. The alternative assumption is that attempts to influence parents and generational differences do not tap the same affective components of the individual. While it is not within the scope of this study to make such a delineation, intercorrelations were run between the two scales in an attempt to partly explain the findings.

The Pearson Product correlation coefficient was run. The correlation between the two scales was -.06, indicating that the two domains were not correlated in any way. This helps in the predictability that students feeling they could not influence their parents did not necessarily perceive generational differences. The intercorrelations between the total scales and their subscales were very high, indicating that constructs within the scales were comparable whereas those between the scales were not.

Conclusions. The purpose of this study was to begin exploring special characteristics of early adolescents with the eventual results having educational implications. The study provided data on two adult and family-related dimensions, namely, generational differences and influences on parents. In addition, two measuring instruments, the Generational Differences Scale and the Influence on Parents Scale were initially administered and reliabilities were obtained.

This study reports on only two of seven scales given to these samples. It is part of ongoing research being conducted on early adolescents. There are findings and interpretations in this data which could not be explored within the context of this paper. However, this study, combined with other forthcoming studies should broaden our understanding of the early adolescents' social characteristics and facilitate educational decision making based on student needs.

An Observational Study of Core and Departmentalized Classrooms: Examing Process Variables in the Eighth Grade

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The purpose of this study was to determine the extent to which core classrooms differed from departmentalized classrooms in the degree to which middle grades teaching strategies were employed. Both empirical studies, which have defined process variables associated with student outcomes, and middle school theoretical works suggest certain teacher and student behaviors which should be present in middle grades classrooms. Classroom observation was used to assess the level of implementation of several process variables which were chosen as indicative of desirable middle grades instructional practice.

Literature

Needs of Transescents

Transescent youth need an instructional program that will help them develop along a number of dimensions: social, emotional, and physical as well as mental. The striving for independence from family and adult authority (Lipsitz, 1980; Hill, 1980) needs to be fostered by balancing student-directed and teacher-directed learning tasks with increased emphasis on student direction in the later middle grades (Klingele, 1979). The need for greater independence requires that students take more responsibility for making decisions concerning their lives. Consequently, opportunities for decision-making in association with values clarification activities are a necessary part of a complete middle grades program (Doda, 1980; Stahl, 1980; Klingele, 1979). Since peer influence reaches its peak during transescence (Mitchell, 1979), student to student interaction within the classroom should be fostered and channeled into productive learning experiences. Both peer tutoring and group investigation strategies have been shown to promote cognitive and affective growth (Sharan, 1980). Another feature of transescence which we ignore at our peril is the vast differences among individuals between the ages of 11 and 14. Early adolescents are more unlike each other than they are during any other age grouping (Mead, 1965; Tanner, 1974). Therefore, they can not effectively be taught without some form of individualization of instruction accounting for a large part of the instructional programs (Lounsbury & Vars, 1978; Klingele, 1979). Lest we lose sight of the fact that transescents are complete persons, not just absorbers of subject matter, we need to remember that they have affective needs associated with socio-emotional development which play a central role in how well they relate to school (Blos, 1972; Redl, 1966). One last consideration is that most students are still functioning at a concrete operational level in the area of cognitive thought. A number are in transition to formal operations, but a very small number characteristically think formally (Epstein, 1979; Brazee & Brazee, 1979; Eson & Walmsley, 1980). Therefore, middle grades instruction needs to be concrete and actively involve students in manipulating their environment.

Core

Relevant to this particular study is the work that has laid out the core approach for teaching early adolescents (Van Til, Vars & Lounsbury, 1967; Vars, 1969; Lounsbury & Vars, 1978). According to these works, core studies would involve use of issues of concern to students, experience-based instruction, decision-making, values clarification, student directed learning, multiple sources of information, and teachers who functioned as advisors, facilitators, friends, and co-learners.

Implementation of Middle Grades Concepts

Previous studies focusing on curricular organization have used paper and pencil measures of product variables (Sinclair & Zigarmi, 1978) in order to analyze differences between interdisciplinary and departmentalized organization. Other studies ranging from Reigle (1971) and Gatewood and Walker (1971) to Erb (1979) have attempted to assess the level of implementation of middle grades practices by using a survey technique focusing on a whole range of issues: curricula, staffing, activities programs, guidance services, as well as instructional strategies. These latter studies provide a gross overview of programs and practices and have relied on the interpretations of building principles as the source of data. No previous studies have been found which have reported the level of implementation of appropriate middle grades practices based on classroom observation.

Conceptualizing Classroom Interaction

Measuring the effects of different curricular organizations on teaching strategies presented several difficulties. Rating scales are notoriously unreliable for recording classroom behavior. No low-inference observation instruments were in existance to allow any direct measure of implementation of middle level teaching strategies. Consequently, this study relied heavily on the empirical and theoretical work of Robert and Ruth Soar. They have defined a "Paradigm of the Environment for Learning" (Soar & Soar, 1979) based on years of observational research in elementary classrooms which has provided a model for analyzing the classroom behavior of both students and teachers. They contend that climate and control are two separate dimensions of classroom interaction. Secondly, they suggest that control is multidimensional. Teachers control three separate aspects of the classroom: student behavior, learning tasks, and thinking processes. Each of these elements can be broken down further (Soar & Soar, in press). Climate consists of teacher positive and negative affect and student positive and negative affect. Control of student behavior consists of four dimensions: teacher use of strong (harsh) control techniques, teacher use of gentle/moderate control devices, student-to-student interaction vs. isolation (which the Soars called Disorder vs. Order), and students following routine with little direct teacher supervision. The control of learning tasks is composed of two dimensions: teacher-centered and directed vs. student-centered and active, and students engaging in differentiated activities. Three dimensions of the management of thought processes have been identified: guided discovery backed up by facts; narrow, one-answer interaction; and guessing, hypothesizing and brainstorming. In the present study the management of thought processes was reconceptualized with the

help of the work of Casteel and Stahl (1973a, 1973b). This study was designed to assess differences between core and departmentalized classrooms in terms of the balance between subject-matter centered discussions and values centered discussions which also tend to focus on higher-order thinking skills. In addition, this study looked at the balance between teacher talk and student talk.

Hypotheses

The main research hypothesis was that core classrooms would contain more teaching strategies suggested in the literature on core than would departmentalized classrooms. It was also expected that core classrooms would exhibit more of the teaching strategies recommended in the middle school literature than would departmentalized classrooms.

This main hypothesis was tested through the use of 14 subhypotheses, stated here in the null form.

There will be no significant differences between core and departmentalized classrooms:

(1) . . . in the amount of teacher negative affect
(2) . . . in the amount of teacher positive affect
(3) . . . in the amount of student negative affect
(4) . . . in the amount of student positive affect
(5) . . . in the teacher use of strong (harsh) control techniques
(6) . . . in the teacher use of moderate and gentle control techniques
(7) . . . in the amount of student-to-student interaction vs. isolation
(8) . . . in the amount of teacher-directed vs. student-directed activities
(9) . . . in the use of student differentiated activities
(10) . . . in students following routine without direct teacher supervision
(11) . . . in the amount of student subject-centered talk
(12) . . . in the amount of teacher talk
(13) . . . in the amount of student values-centered talk
(14) . . . in the amount of time devoted to small group and individual activities

Procedures

Sample

The sample for this study consisted of 14 eighth grade classrooms containing 492 students. Four of the classrooms were common learnings (core) classrooms which met daily for a two-hour block of time. Ten classrooms were departmentalized (four social studies and six English) and met daily for 55 minutes. The core teachers had an average of 11.75 years of teaching experience. The departmental teachers averaged 10.4 years of experience. The core classrooms were housed in a single 7-9 junior high and the departmental classrooms were housed in two other 7-9 junior high schools all located in a unified school district in a mid-western community of 50,000 people.

Data Collection

During the 1979-80 school year 42 half-hour video tapes were made of the classrooms in this study. Unusual days such as those when assemblies occurred or those just before or after holidays were avoided. Each of the 14 teachers in this study was observed on three occasions -- once during late fall 1979, once during winter 1980, and once during the spring of 1980.

Two low-inference observation instruments were used to code the video tapes. The climate and some control variables were measured using a sign system, the Florida Climate and Control System (Soar, Soar, & Ragosta, 1971, n.d.). The verbal interaction variables, which relate to control of thought processes were measured with the help of a category system, the Social Science Observation Record (Casteel & Stahl, 1973a, 1973b). In coding the tapes, the very beginning and very end of class time were avoided in order to focus on the middle of the lesson.

Data Analysis

The 160 or so items on the Florida Climate and Control System (FLACCS) were clustered into meaningful variables as suggested by previous studies of the Soars (Soar & Soar, 1976, 1979; Soar, 1980a; Soar & Soar, in press). These variables are referred to in the first ten hypotheses. The seventeen categories on the Social Science Observation Record (SSOR) were reduced to four variables of interest by procedures described by Casteel and Stahl (1973a, 1973b). These four variables are referred to in the last four hypotheses.

Two different approaches were used to estimate the reliability of the measures reported in this study. The first was to calculate interobserver agreement using the procedures developed by Scott (1955). The estimate of reliability for the four SSOR variables reported here is $r = .95$. The estimate of reliability based on interobserver correlation is $r = .80$ for the FLACCS variables.

The shortcomings of using measures of interobserver agreement to estimate the reliability of observational studies have been documented elsewhere. (McGaw, Wardrop, and Bunda, 1972; Rowley, 1976). Therefore, intraclass correlation reliability coefficients based on analysis of variance which takes into account between-subjects and within-subjects variance were calculated (Bartko, 1976, 1978; Algina, 1978). These coefficients are displayed in Table 1. One would expect these reliability coefficients based on the observation of behavior to be lower than coefficients based on paper and pencil instruments. Values in the .30's, .40's and .50's are quite common (Soar, 1980b).

The hypotheses were tested for statistical significance using an F-test with an analysis of variance repeated measures design. The BMDP2V program was used for this purpose. However, since some of the variables were not observed on every occasion for both curricular organizations, some cells have zero variance. Since the assumption of homogeneity of variance was questionable and since cell sizes were unequal the robustness of the F-test could not be taken for granted (Kirk, 1968, p. 61). Consequently, for some variables the non-parametric Mann-Whitney U statistic was calculated in order to verify the observed F ratio.

Table 1

Intraclass Correlation Reliability Coefficients

Variable[a]	Coefficient[b]
Teacher Negative Affect	.00
Teacher Positive Affect	.84
Student Positive Affect	.73
Teacher Strong Control	.13
Teacher Gentle/Moderate Control	.80
Student-Student Interaction/Isolation	.00
Teacher-Directed Vs. Student-Directed	.45
Student Differentiated Activities	.30
Student Subject-Centered Discussion	.99
Teacher Talk	1.00
Student Values-Centered Discussion	.41
Small Group/Individual Work (Silence)	1.00

[a]Two of the original variables (Student Negative Affect and Student Follows Routine) were not analyzed because they were not observed to have occurred.

[b]Spearman-Brown

Results of Analysis

Of the original fourteen hypothesis two were not tested since the relevant variables were not observed to occur. Neither student negative affect nor students following routine without direct teacher supervision occurred in the observed classrooms.

In addition, eight null hypotheses were accepted. No differences between core and departmental classrooms were observed for the following variables: teacher negative affect, teacher use of strong control, teacher use of moderate and gentle control, student-to-student interaction, teacher-directed vs. student-directed activities, student subject-centered discussion, teacher talk, or amount of time devoted to small group and individual activity.

On four variables core classrooms and departmental classrooms were observed to be significantly different based on either the F-test or Mann-Whitney U or both. In each case the difference was in the expected direction, core classrooms having higher means than departmental ones. Both student positive affect and student differentiated activities were found to be significantly higher in core classrooms based on both parametric and nonparametric tests of significance. Student values discussion was found to be significantly higher in core classrooms based only on the parametric test and teacher positive affect was found to be higher based only on the nonparametric test.

Table 2

Raw Cell Means and Standard Deviations of Each Variable for Which Either a Significant F or Mann-Whitney U was Observed

	Core[a]			Departments[b]		
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
Teacher Positive Affect						
$\bar{X}$	4.00	4.00	10.50	3.30	1.80	5.90
S_x	4.97	2.71	4.80	2.58	2.94	5.49
Student Positive Affect						
$\bar{X}$	3.25	2.75	6.25	0.60	1.20	3.60
S_x	5.25	1.50	6.34	0.70	1.23	3.10
Student Differentiated Activities						
$\bar{X}$	1.50	0.50	2.50	0.20	0.00	0.80
S_x	1.73	0.58	2.38	0.63	0.00	1.48
Student Values Discussion						
$\bar{X}$	0.00	0.50	2.25	0.00	0.10	0.00
S_x	0.00	1.00	3.86	0.00	0.32	0.00

[a] $n = 4$

[b] $n = 10$

Findings

Climate

Core classrooms tended to have a more positive atmosphere than did departmental ones. Both teacher and student behavior demonstrated larger amounts of positive affect. Core teachers exhibited more of the following types of verbal and non-verbal behavior than did departmental teachers:

giving verbal praise, demonstrating enthusiasm, giving individual attention, listening carefully to students, and smiling, laughing, and nodding. Examples of the types of student behaviors which were more prevalent in core classrooms included demonstrating enthusiasm, helping others, smiling or laughing with another person, and being cooperative.

In spite of the fact that core classrooms were found to be more positive in affect, there was no difference between core and departmental classrooms in the amount of negative affect observed. In neither type of classroom did we observe teachers often using these types of behaviors: using threatening tones, criticizing students, yelling, frowning or refusing to respond to students. Likewise, we found no examples of students teasing, making disparaging comments, fault finding, resisting, pouting, or hitting. The items listed here are only examples of longer lists of items which make up the variables being discussed. It was our observation that much classtime was spent in a rather affectively neutral climate, neither positive nor negative.

Table 3

Observed F Ratios and Mann-Whitney U Statistics for Variables Significant at p=.05 for Either Test

	F	p	U	p
Teacher Positive Affect	2.68	.127	123.0	.056[a]
Student Positive Affect	4.53	.055[a]	124.0	.059[a]
Student Differentiated Activities	10.24	.008	87.5	.005
Student Values Discussion	6.07	.030	140.0	.134

[a]Though these values do not adhere to a strict interpretation of p=.05, they are included for discussion since this study is a first attempt to examine these variables through systematic observation in the middle grades.

Control of Behavior

No significant differences were found between core and departmental classrooms on any measure of the control of student behavior. Core and departmental teachers did not differ in the use of either strong or gentle control techniques. Strong control techniques include controlling behavior by interrupting students, commanding students, using a sharp tone, or glaring. Gentle and moderate control devices include praise, correcting wrong answers without criticism, directing with a stated reason, and touching or patting. Neither did the two types of classrooms differ on two measures of student behavior. On a factor we are calling student-to-student isolation vs. interaction, a measure of the amount of student

socialization in the classrooms, both types of classrooms were high on isolation and low on interaction. This means that as part of a lesson students seldom talked to each other in either core or departmentalized situations. In neither core nor departmental classrooms did students follow routine with little supervision. Items on this factor were so seldom observed that a statistical analysis could not even be carried out.

Control of Learning Tasks

Of the two variables analyzed in the category control of learning tasks, one revealed differences between core and departmentalized classrooms, the other did not. On the teacher central and teacher-directed activities vs. pupil central and pupil active dimension there were no significant differences between core and departmentalized classrooms. Both were high in teacher-centered activities and low in student-centered ones. However, on the second dimension, core classrooms demonstrated more student differentiated activities than did departmental ones. In core classrooms, for example, students did more seatwork without the teacher. They also had some limited choice over the tasks to be performed. Teachers more often gave students close individual attention.

Control of the Thinking Process

Core and departmentalized classrooms revealed very similar patterns (Table 4) of student and teacher talk. When the two types of classrooms were compared on the amount of student subject-centered talk, amount of teacher talk, and amount of silence (an indicator of small group or individual work or wait-time), no significant differences were found. However, inspite of the fact that only 0.29% of the total observed class-time was devoted to student values-centered discussion a significant F ratio was observed when the core mean of 0.93% was compared to the departmental mean of 0.03%. However, the nonsignficant nonparametric U statistic may be more meaningful in this case since three of the six cells had means and standard deviations of zero. In any case it is an open question as to whether less than one percent of class time devoted to values-centered discussion is educationally significant.

Student-teacher verbal interaction in both types of classrooms was essentially the same. Most talk was teacher talk. In class discussions teachers talked about three times as much as all the students combined. What little student talk that did occur was centered on discussing subject matter content. Most of that discussion was limited to giving one or two word answers to teacher questions (i.e. recall of previously learned facts). Seldom did students elaborate on basic recall by assigning meaning or interpreting facts, or even giving an extended explanation of some aspect of subject matter. Both types of classrooms were high on one-answer interaction. On the other hand, students were virtually never asked to state preferences, discuss consequences, back up statements with logic and evidence, make value judgements or express feelings. Both types of classroom were low on guided discovery or hypothesizing/brainstorming.

Table 4

Percentages of Different Types of Student and Teacher Talk

	Core	Departments
Student Subject-Centered	18.67	21.43
Student Values-Centered	.92	.03
Teacher	62.16	61.13
Silence (Small Group/Individual Work plus wait-time in a whole group discussion)	17.83	17.27

Conclusions

Implementation of Core

Any advantages to core appear to be due more to the block-of-time schedule than to the implementation of the core curriculum as described by Van Til, Vars, and Lounsbury (1967). The two-hour time period allowed, perhaps forced, core teachers to engage in a greater variety of total-group activities and to provide students more opportunities to engage in small group and individual work. The whole-group lecture/discussion or seatwork where everybody was doing the same thing could not be sustained for two periods. Whereas, after time was taken out for getting organized, and later in the period for getting ready to move to the next class, teachers in a one-period time block could get by with less variety. The greater amount of both teacher and student positive affect also supports this conclusion. When teachers and students interacted for two hours per day rather than just one, they could get to know each other on a more personal level. Therefore, they were more likely to interact with each other in a more relaxed manner.

However, the fact that there were no differences between core and departmentalized classrooms when compared on the amounts and nature of student and teacher talk, suggests that the core classrooms were not problem-centered. Students were not asked to assign meaning to facts or even to elaborate on them let alone suggest alternative solutions, examine consequences, state preferences, or back them with criteria. In addition, the evidence that core classrooms were as teacher-centered as departmentalized ones, and at the same time low on student interaction and low on student work without direct supervision suggests that the core classrooms in this study were not centered around the needs and interests of students any more than they were about the problems of contemporary society. Anecdotal data on the content of lessons and the teaching strategies employed supports

the conclusion that the core classrooms in this study were no more problem-oriented and student-centered than the departmental ones. However, they tended to be more affectively positive and did provide more variety in learning tasks.

Implementation of Middle Grades Theory

The traditional junior high classrooms observed in this study, both core and departmental, were doing little to promote the balanced growth and development of the 492 early adolescents contained in them. The need to establish independence did not appear to be taken much into account. There was heavy emphasis on teacher direction of learning tasks with little opportunity for students to develop decision-making skills. Only once or twice in 42 observations was any attempt made to relate subject matter to the lives of students. Students received no help in their efforts to examine and develop values. Subjects were characteristically taught as things to be learned because the teacher said so not as entities which had relevance to the lives of the students.

The role of peers in the lives of early adolescents, was another under-used factor in the observed classrooms. There were few opportunities for students to interact with each other. Although some peer tutoring was observed and a single observation of group investigation was made, the predominate pattern was to keep students isolated from each other and interacting with the lesson only through the direct mediation of the teacher.

Individualization of instruction in any of its forms was very rare. Some of the observed classrooms were, however, ability grouped. Whole-group activities were by far the most common ones observed. This was true even though many lessons dealt with basic skill development in the areas of composition, spelling and grammar.

Teaching early adolescents through concrete experiences in which they could actively manipulate their environments was uncommon in the observed classrooms. Since only about six percent of thirteen-year-olds are mature formal thinkers (Epstein, 1979; Brazee & Brazee, 1979), it is not likely that the vast majority were learning efficiently, if at all, from large doses of lecture/discussion. Yet this teaching strategy was prevalent, especially in social studies classes where such abstractions as "nationalism" "revolution," "balance of power," and "depression" were dealt with mainly with teacher talk supplimented by an occasional student response to short-answer questions. Learners at the concrete operations level would have a difficult time relating to much of the material being taught in the classrooms in this study.

Implications

For Further Research

This study confirms some of the findings of survey research concerning the implementation, or lack thereof, of middle school theory in middle level schools. However, since only a single school district was involved in this study, more observation in middle grades classrooms needs to be done. Interdisciplinary teams need to be assessed as well as core and departmentalized classrooms. In addition, program areas other than language arts and social studies need to be assessed such as exploratory classes and advisor base classses.

Not only do we need to develop a broader knowledge of what is going on in middle grades classrooms, we need to develop better ways of observing these classrooms. The two instruments used in this study, each developed for use at different grade levels than those at which they were used here, need further refinement to be effective tools for middle grades observation. Other low-inference measures of classroom process variables need to be identified, adapted, and/or developed for use in middle level classrooms. We are just beginning to develop the tools for effective observation in the here-to-fore neglected middle grades.

For Teacher Education

A growing number of studies which have documented the gap between theory and practice, suggest that teacher preservice and inservice programs need to do a better job of helping teachers understand the concepts necessary for effective middle grades teaching and better acquire the skills necessary to implement them.

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AN OBSERVATIONAL ANALYSIS OF PROBLEM SOLVING STRATEGIES USED BY TRANSITIONAL EARLY ADOLESCENTS

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One of the most important developmental characteristics of the middle school student is the acquisition of more abstract thinking abilities. As summarized by Sund (1976, p. 48), Piaget describes early adolescence as the period of transition from concrete operations to formal operations. During the age range from 11 through 14 years, the early adolescent begins to demonstrate new cognitive abilities. He more consistently performs concrete operations such as reversibility, conservation, classification, and seriation. He begins to demonstrate more abstract operations such as reflexive, propositional, and conceptual thinking.

A number of researchers have demonstrated the importance of this early adolescent period in the development of these cognitive operations. Toepfer (1979) summarizes research in brain growth periodization and academic achievements, demonstrating the biological bases for Piagetian stages in cognitive development and emphasizing the critical nature of the growth period from ages 10 - 12 and the subsequent plateau period from ages 12 - 14. The work of Epstein and Toepfer (1978) suggests that brain growth and the accompanying sophistication of thought processes does not occur incrementally but rather in a series of spurts and plateaus. Of special importance is the "turn off" phenomenon experienced by many middle school students faced with increasingly complex academic expectations during periods of brain growth plateaus (1979, p. 19). Malone (1975) demonstrates the powerful correlation between cognitive development and reading achievement in sixth and seventh grade pupils. Even when the effects of sex, age, grade level placement, and language ability are held constant, scores on concrete operations tasks correlate significantly with reading achievement scores. Given the inter-relationships of brain growth patterns, cognitive development, and academic achievement, the transition from concrete to formal operations would seem to be a critical time in cognitive development. This study seeks to explore the processes of transition in selected fifth and sixth grade students.

Ankeney and Joyce (1974), Burney (1974) and Sund (1976) have developed procedures for assessing cognitive development through written tests and interview tasks. Such measures provide estimates of students' levels of cognitive processing. Such measures, however, do not describe the nature of that processing. "Process" questions of interest include: how do transitional students attempt to solve new problems? what types of thinking do they demonstrate as they attempt solutions? what strategies do they use repeatedly? This study attempts to describe the problem solving strategies used by students in the transitional period.

Research Population and Sample Group

Fifteen students were selected at random from the 73 fifth and sixth grade students at Holcomb Campus School in Geneseo, New York to be the sub-

jects of the observational dimension of the Reading and Cognitive Development Study. These students were given the Concrete-Operational Reasoning Test developed by Ankeney and Joyce (1974). The eight students who scored twenty points or higher on the thirty item test were then given the Logical Reasoning Test developed by Burney (1974). The four students rated "transitional" on this test became the subjects of this observational analysis.

Research Design, Procedures, and Analysis Techniques

The observational analysis of transitional students is the first phase of a year-long investigation in Reading and Cognitive Development. In January 1980, the 73 fifth and sixth grade students at Holcomb Campus School were given The Metropolitan Reading Achievement Tests and the Concrete-Operational Reasoning Test. Fifteen students were selected at random to be the subjects of the observational dimension of the study. These fifteen students were divided into four groups on the basis of their scores on the Concrete-Operational Reasoning Test. The author and three graduate students composed the research team for gathering observational data. Using materials from Thinklab (SRA), Basic Thinking Skills (Harnadek, 1977), and Interview Activities (Sund, 1976), the author compiled a schedule of fifty-five problem solving activities incorporating tasks in twelve dimensions of both concrete and formal operations. The four groups of students then met with a researcher for seven sessions to complete the problem solving tasks. During each forty-five minute session, the research member acted as facilitator, giving directions, encouraging students to talk about the problems, and recording all comments on cassette tapes. The researchers tried wherever possible to encourage students to verbalize their thought processes, asking questions such as "how did you figure that out?" "what were you thinking?" and "what is going through your mind as you try to solve this problem?" During April and May the research team began analyzing the recorded data, categorizing responses according to the appropriate concrete or formal operation involved. The author then began to synthesize data and to generate descriptors for recurring patterns of behaviors among the transitional students. These patterns were tested in re-analysis of the recorded data and emerged as "problem solving strategies." A second set of test scores will be gathered from all 73 students and statistical analyses of correlations of gain scores in reading and concrete operations will be completed before a follow-up study is initiated in the fall of 1980. This study presents the findings from the analysis of the problem solving behaviors of the four transitional students.

Findings

Students' performances on the fifty-five problem solving tasks and their verbalizations of their thoughts demonstrate dramatically the "transitional" nature of their thinking. All four students had little difficulty with the concrete problem solving tasks. On several occasions, they solved potentially concrete problems in abstract fashion, choosing to "think out" solutions rather than manipulate objects. Each student also demonstrated the use of

four different problem solving strategies but each student also demonstrated incomplete mastery of these formal operations. In essence, the students were "trying out" new modes of thinking, experimenting with new powers of analysis and excited by the prospects of discovering solutions.

In analyzing their approaches to the formal operational tasks, four primary problem solving strategies emerged:

Visualization - students created mental pictures of solutions.

Experimentation - students tested hypotheses and tried out possible solutions.

Abstraction - students form generalizations, synthesize concepts, and eliminate factors that do not apply.

Extension - students apply strategies from previously solved problems or other circumstances to new problems.

In their use of "visualization" problem solving strategies, students demonstrated their ability to "see" a solution without manipulating materials or further analyzing input. When given a problem about three playing cards, Jeff said, "I just pictured the answer in my head, the way it had to be." Danny replied, "I just kind of drew a mental picture." When asked to solve "image pattern problems" (Thinklab, 1974, numbers 31-34), Kathy suggested, "I just looked at them before tracing them out and said, 'This will work.'" Daryl gave a similar response. When asked to recreate an additional triangle by rearranging toothpicks, Jeff explained, "I saw the triangles moved around into four sides and thought of a trapezoid." These examples demonstrate the ability of these transitional students to "see" solutions to problems in their heads and reflect one dimension of their growing abilities to think abstractly.

In their use of "experimentation" problem solving strategies, students demonstrated their ability to generate possible solutions and "try them out." When asked to turn a triangular arrangement of discs upside down by moving only three discs, Jeff said, "I knew the bottom one had to come to the top so I just kept moving others around." When asked to find the number of triangles in a geometric figure, Kathy replied, "Nine, no, wait, there might be more, some could be bigger . . . yes, there is one more, and another, and another." Given a problem of letters arranged in a sequence, Jeff suggested, "It's that letter plus two, then three . . . no wait, that won't work." This ability to generate hypotheses and test them with the data is another dimension of their development of formal thinking.

In their use of "abstraction" problem solving strategies, students demonstrated their ability to identify concepts and eliminate extraneous information. As Kathy explained it, "It's a matter of deciding what matters in the problem and what doesn't." Given a long word problem about days of

the week and accompanying events, Jeff and Danny both suggested that all one needed was the sequence of activities. Kathy, Danny, and Daryl replied that all one needed to know to estimate the relative height of a stick man in an interview problem was the relative size of the paper clips used to measure them. In analyzing the problem about a sequence of playing cards, Kathy said, "There have to be spades next to each other and a heart next to the spade--that's all you need." In solving the "memory logical reasoning" interview task, Jeff devised a number sequence and remembered the numbers. In order to solve the spoons puzzle he noted, "You have to move them in pairs." These examples demonstrate these students' ability to perform combinational logic, generating essential concepts and eliminating unnecessary information.

In their use of "extension" problem solving strategies, students revealed another dimension of abstract thinking, the ability to apply previously learned strategies to new situations. Given the task of computing the volume of a fish, Danny and Jeff related it to their geometry problems. Daryl suggested, "It's just like when I get into the bath tub." When Kathy read a letter sequencing task, she related it to a similar problem she heard on the radio. She related another problem to one she read in Reader's Digest. After solving the toothpick problem where he related triangles to a trapezoid, Jeff extended the next problem to another geometric figure, this time suggesting, "If there're five cages, it's probably a pentagon."

It is perhaps in the use of "extension" strategies that students most clearly demonstrated their use of formal reasoning. As Sund (1976) suggests, the ability to develop sets of operations as strategies and use and modify them in new situations is a critical aspect of formal operations.

> Performing higher levels of reasoning and abstract thought requires individuals to follow logical patterns and rules. Formal-operational children use their minds to a higher degree than those in the stages below them to check what is perceived . . . . Because higher levels of thinking are structured and require that definite operational patterns and processes be followed, they are more formal in structure. (p. 49)

In their use of these four problem solving strategies, these students demonstrated their attainment of such logical operational patterns and processes. The four students did not solve all of the problems in the same ways, sometimes demonstrating different strategies in response to the same problems. On the playing card problem, for example, Daryl and Kathy "abstracted" and Danny and Jeff "visualized." On the memory logical reasoning task, Kathy and Danny "visualized"; Jeff and Daryl "abstracted." Such variability underscored the range and flexibility of their abstract thinking.

While each of the four students demonstrated their ability to use all

four strategies in some settings, each had some difficulty with each strategy in other settings. While one student was able to use visualization proficiently with object manipulation problems, he was unable to visualize solutions to image pattern problems, tracing and re-tracing patterns with his pencil with no mental image in mind. Another student could visualize solutions to tracing problems but had to concretely "walk through" a time-distance problem about intersecting trains. While all four students "experimented" frequently with most problems, none of them could see more than one possibility for sequencing letters. All four also had difficulty generating any possible solutions to several problems, even when given hints. While also able to "abstract" frequently, all four students had a tendency to fixate on literal details at times. One student insisted, for example, that there was only one interpretation of a sentence from "Jack and Jill" (Harnadek, 1977), even when the others suggested five or six interpretations. Another student could not venture a guess about the secret of the "scissors game," even after four explicit clues.

Conclusions

The above examples and many others demonstrate the "transitional" nature of the students' thinking, their ability to perform concrete operations consistently and to perform formal operations in some instances but not in others. That inconsistency serves to characterize "transition." Increasing thinking capacities and observable changes in thinking behaviors from week to week suggest that these four students may have been in a "growth spurt phase" in brain development. During several sessions they solved problems presented weeks before, problems they seemed incapable of solving at the time. During each session, they were excited about the problem solving activities, making up their own test items, devising thinking games and giving up their "break time" to work on problem solving activities. One student even wrote a series of problems for the teachers to solve and distributed her problems on "test sheets" to all researchers.

The description of these problem solving strategies suggests a need for further "process oriented" research. While based on a very small sample, these strategies serve as descriptors for some of the complex thinking evidenced in students' verbal comments. Insights such as these begin to provide some clues to the ways students think as they approach new problems. These strategies may serve as starting points for observation by other teachers in other settings. By using similar verbalization procedures, other teachers may find evidence of a number of additional strategies and gather more information about the ways early adolescents think. The results of this study also suggest the need for classroom teachers to encourage verbalizations about thinking and to provide a number of "thinking skills" enrichment activities. Such activities often correspond to content-based academic tasks. Reading, language arts, math, science, social studies--any subject area can serve as the source of thought problems, perplexing situations that stimulate

thinking and can serve as focal points for verbalizing thought processes. By providing stimulating activities and setting aside time to discuss approaches to problem solving, teachers can demonstrate their valuing of thinking. Students have an opportunity to hear how other students think and to see a variety of perspectives. In sharing such thinking experiences, early adolescents may find tremendous intellectual excitement, so much so that one of the students in this study remained in the room at recess time studying a story problem card and telling the researcher, "Don't give me the answer, I'll think of it."

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Development of a Categorical Observation Scale to Measure Teacher Time Use

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One instructional process variable has been demonstrated to be linked clearly, consistently and significantly to academic achievement: the amount of time spent in direct academic instruction (Corno, 1979). So powerful is the relationship between these variables that even the most generalized measures of either show significant correlations. To illustrate, even when measures such as average daily school attendance (Wiley and Harnischfeger, 1974), teacher reports on the length of the school day (Harris, et.al., 1968), and pupil and teacher absence (Bond and Dykstra, 1967; Harris, et.al., 1968; Harris and Serwer, 1966) were correlated with measures of achievement in reading and mathematics, the results were significant.

Somewhat more precise studies, distinguishing academic from non-academic expenditures of school time, have yielded similar results. Upon assessing the ways in which school time was used, Stallings and Kaskowitz (1974) concluded that time spent on academic topics, regardless of the nature of that time, was correlated with achievement in mathematics and reading. Furthermore, time spent on any other activity yielded negative correlations

with academic achievement. No nonacademic activity yielded positive correlations with reading and mathematics achievement.

Looking specifically at the type of teacher-student interaction that is most clearly related to academic achievement, Hoge and Luce (1979) discovered that on-task interactions, almost regardless of their nature, are correlated positively with academic achievement. This correlation appears to exist regardless of whether the teacher or student initiates the interaction.

Time on instructional task findings are not entirely free of contradiction. Socio-economic status of the pupils, the nature of the academic content and the general ambiance of the teaching-learning situation have been identified as potential intervening variables (Rosenshine, 1976). There is strong agreement, however, that much of the variability in current time-on-task research may result from the absence of reliable and valid instruments to assess the amount of time spent on direct instruction (Corno, 1979; Rosenshine, 1976; Hoge and Luce, 1979). More specifically, most observation has focussed upon the student, resulting in the use of high inference, and therefore, quite unreliable, measures, such as "attention," "withdrawal," and "alienation" (Hoge and Luce,1979). A more useful approach may be to focus attention on the relatively low-inference assessment of the amount of teacher time spent in direct instruction.

The amount of time spent on academic instruction is strongly linked to student achievement. Vagaries in some research findings

appear to be directly related to the quality of the observation instruments used, many of which are unreliable because of their reliance upon high-inference assessments of student behavior. Teacher intervention is a less elusive variable which has a significant impact on academic time expenditure, and researchers agree that the development of an instrument to assess teacher time useage would be valuable indeed.

The purpose of the present study, then, is to construct and establish the reliability of an observation scale to measure teacher time use.

Procedure

A list of teacher activities was constructed by the researchers after viewing videotapes of actual classroom teaching. These activities were described as single sentences indicating a specific action or utterance made by the teacher. A sample of these behavior listings follows:

"Teacher demonstrates procedure for focussing microscope."

Teacher asks Susan, "How was your trip to Florida?"

"Teacher sets up equipment for demonstration of titration lab."

Teacher says, "Put all of your answers on the answer sheet."

Categories of teacher time use activity were derived from the listing of teacher behavior. Operational descriptions of each category were prepared. A panel of three teacher educators was asked to categorize the original list of teacher behaviors using the category system provided by the researchers. They were also asked to make recommendations for altering the categories to make them more complete and descriptive.

From this information the Teacher Time Use Inventory (TTUI) matrix was devised with two sub-scales. The first sub-scale divides teacher actions into behavior initiated by the teacher or behavior in response to the actions of another. The second is a teacher activity sub-scale. This scale was divided into five major teacher activities: Direct Instruction, Indirect Instruction, Managing Instruction, Managing Behavior, Off-Task Behavior, and other or uncodeable.

At five second intervals observed teacher behavior is coded according to one of the TTUI categories. For each interval, one of the eleven category codes described on the matrix sheet is listed representing the nature of the teacher behavior occurring at the time of the observation.

The first number in the code identifies whether the behavior was initiated by the teacher or not; the second number in each code specifies the nature of the activity/behavior of the teacher.

A copy of the instrument matrix, with operational definitions for each category, is presented in Appendix A. Directions for the use of the instrument are presented as well.

In order to conduct a study of the TTUI's interrater and intrarater reliability, four trained observers used the instrument to record the teacher behavior they observed on three video tapes filmed in elementary, middle school and high school classrooms. In order to standardize the stimulus, a time frame generator was used to record a running time clock on each tape, and the coding sheets were keyed to accurately timed five-second intervals.

Within five days of the training session, each observer scored a four minute segment from the beginning, middle and end of each tape. Each segment was identified on the coding form in elapsed time so that all raters observed the same portion of each tape. In order to secure a measure of intra-rater reliability, each rater scored the same tape segments eight weeks after the training session. During that time, they received no additional training or practice.

In order to achieve a score for the total tape, the number of codings in each category in each of the three segments were added together. This provides a frequency record of the number of observations made in each of the eleven categories of the TTUI.

To determine the amount of agreement among raters, Scott coefficients (Scott, 1955) were computed to assess the relationship between the codings awarded by each pair of raters. Although generally considered a measure of reliability, Ober (1971) suggests that Scott coefficients also provide a measure of validity for an observational scale. If observers agree on the coding of a behavior, the instrument provides an ample description of that behavioral category.

Table 1 presents the Scott coefficients indicating the agreement among the three raters on the trial made within five days of training.

TABLE 1

SCOTT COEFFICIENTS INDICATING
INTER-RATER RELIABILITY OF
TIME USE INVENTORY
(TRIAL 1)

		Rater 2	Rater 3
TAPE A	Rater 1	.83	.68
	Rater 2		.65
TAPE B	Rater 1	.69	.77
	Rater 2		.87
TAPE C	Rater 1	.60	.60
	Rater 2		.75

The coeficients indicate an adequate amount of agreement to suggest that the instrument demonstrates sufficient interrater reliability to be of use to researchers and supervisors. However, if categories 11, 12, and 13 and 21, 22, and 23 are combined, giving a more generalized measure of on-task, management and off-task behavior, the reliability can be increased even more. Table 2 presents the Scott coefficients resulting from the analysis performed on these combined scores.

TABLE 2

SCOTT COEFFICIENTS INDICATING
INTER-RATER RELIABILITY OF
TIME USE INVENTORY:
COMBINED CATEGORIES
(TRIAL 1)

		Rater 2	Rater 3
TAPE A	Rater 1	.90	.85
	Rater 2		.87
TAPE B	Rater 1	.91	.85
	Rater 2		.74
TAPE C	Rater 1	.75	.61
	Rater 2		.68

In order to be of use in research or supervision, an instrument must yield consistent results when employed by the same rater over a period of time. In order to establish this intrarater reliability for the TTUI, Scott coefficients were computed between the codings performed by each rater immediately after training and the codings performed eight weeks later. Table 3 presents the results of this analysis and shows the consistency of the ratings over time.

TABLE 3

SCOTT COEFFICIENTS INDICATING
CORRELATION BETWEEN RATINGS FOR EACH TRIAL:
INTRA-RATER RELIABILITY

	Rater 1	Rater 2	Rater 3
Tape A	.79	.78	.85
Tape B	.78	.79	.87
Tape C	.67	.75	.76

Conclusions

The results of the present study indicate that teacher time use can be measured reliably with a categorical observation system and that this measurement is quite stable over time. In particular, the Teacher Time Use Inventory is a reasonable scale for use in research on classroom time use and as a source of data for clinical supervision.

Interater reliability, although adequate, will probably be improved by increasing the amount of practice and feedback given the raters. Since Scott coefficient calculations factor out the amount of agreement that can be attributed to chance alone, however, the relationships are actually stronger than might be suggested by the coefficients. For purposes which require only the identification of generalized time use (on-task, off-task, managerial), the instrument yields high reliability coefficients.

In addition, the stability of the TTUI over time is indicated by the intrarater reliability coefficients presented in Table 2. This feature is especially important for those who would use the instrument to detect changes in time-related teacher behavior as a result of some intervention, either experimental or supervisory. The ability to detect differences in these time use patterns is especially important in light of the connection between time use and achievement, and has been a problem in existing research. The TTUI seems to provide a reasonable and useful step in the direction of improved data collection methods.

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TEACHER TIME USE MATRIX

Appendix A

	INITIATING	RESPONDING
Direct Instruction	(11) Teacher presents content-related information in a planned fashion: lectures, demonstrates, reads to students, etc.	(21) Teacher presents content-related information in response to student question or diagnosed difficulty: responds to question with content information, delivers information in response to student errors.
Indirect Instruction	(12) Teacher suggests content-related activity or thinking: asks content questions, presents problems, presents data and asks for inferences, conclusions, etc.	(22) Teacher listens to students, prods student to answer own question or correct own mistakes: answers question with question (Howdo you think we should do it?), reminds student of procedures (OK, what do you do next?), has student assess own work (Is that correct?), rewards correct responses.
Managing Instruction	(13) Teacher sets up/maintains instructional context and environment: prepares materials, sets up demonstration or equipment, arranges room or instructional space, passes out materials, checks to see if all students are prepared to begin work, sets content-related rules.	(23) Teacher adjusts instructional context in response to student performance or behavior: repeats directions, corrects misperceptions regarding process, monitors student work.
Managing Behavior	(14) Teacher sets behavioral expectations: sets rules for behavior, tells students of expected conduct, organizes students for activity (line up for lunch, etc.), sets rules for specific activity such as game or non content-related activity.	(24) Teacher responds to student behavior: reprimands, praises, reassures, corrects, reminds student of rules, scolds, punishes, rebukes, verbally or non-verbally.
Off-task Behavior	(15) Teacher not engaged in instruction or management: daydreaming, random activity (rearranging desktop) leaves room under own initiative, etc.	(25) Teacher responds to non-task behavior or activity of another: responds to interruption (PA system, firedrill, visitor) responds to non-instructional need (helps with galoshes), engages in friendly banter or conversation unrelated to subject matter.
Other	(99) . . . n o t c o d e a b l e . . . confusion, random activity by students, no identifiable instruction occuring	

Directions for Use: The purpose of the "Teacher Time on Task Assessment" is to measure the manner in which teachers use classroom time. At five second intervals, code the teacher behavior you observe. For each interval, one of the eleven category codes described on the matrix sheet should be listed (11, 12, 13, 14, 15, 21, 22, 23, 24, 25, 99), representing the nature of the teacher behavior occuring at the time the observation is made.

In coding the behavior, you are to consider two sub-scales: an initiation/response sub-scale and an activity sub-scale. First, decide if the behavior is initiated by the teacher or a teacher response to the behavior of another person; that will tell you which column the coding will be in. For each category, the column is represented by the first digit of the code number. Categories 11, 12, 13, 14 and 15 are all listed under teacher initiated behavior; categories 21, 22, 23, 24, and 25 describe responding behavior. Category 99 is listed under both categories and describes behaviors that are not codeable or are irrelevant to the observation.

The second number in each category code shows the nature of the activity/behavior of the teacher: whether it is direct instruction, indirect instruction, managing instruction, managing behavior, or off-task. In other words, the second digit in each code number shows the row into which the behavior is categorized. To illustrate, if the teacher were to ask a content-related question ("How often does Haley's Comet appear?), it would be coded under column 1 -- teacher initiated -- and row 2 -- indirect instruction. That particular behavior, then, would be assigned the code number "12".

In all cases, the behavior of the teacher in context should dictate the coding you use. If the teacher asks a question to begin the lesson, it would be coded as 12. If, however, the teacher were to ask a question in response to a student questions (S: How do we adjust this microscope? T: Who can tell us how to adjust the microscope?), the code would be 22. A similar example might be given for teacher praise. If praise is given in response to some non-content-related behavior ("John, I really appreciate the way you helped out with the younger children today"), it would be coded as 24. Silence, when used to provoke student thought and additional responses, would be a 22; if it is used to reprimand or secure behavioral compliance, it would be a 24.

Remember, too, that you are to focus on the teacher. It is what the teacher is doing that is important in this case. Do not try to infer motives or confuse observation of student behavior for that of the teacher. If for example, the students are working quietly and the teacher is gazing out the window, the activity should be coded as a 15, regardless of how on-task student behavior might be.

If you are unsure of a code, determine as much of it as you can: whether it is initiating or responding or what level it seems to be. Rely upon your initial judgement to do the coding; it's likely to be the most accurate.

C. K. McCann
January, 1980

DEVELOPMENT OF INSTRUMENTATION FOR DETERMINING DISCIPLINARY STYLES OF SCHOOL TEACHERS

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This paper concentrates on the problem of developing instrumentation for determining middle-school teachers' styles of classroom discipline. Selecting teachers for the school's faculty is one major problem for the school administrator: there is the problem of determining what kind of classroom disciplinarian a prospective teacher would be and then deciding if the candidate's discipline style is compatible with the school's discipline philosophy.

In recent years, the behavior of children in the public school classroom has been of paramount interest to educators. Teachers continue to rate classroom discipline as their number one problem. The Gallup Poll of public attitudes towards education for seven of the last eight years has found that "the public's number one educational concern--more than busing, budgets, or basics--is school discipline.[1]

According to Ayllon, teacher's attitudes regarding classroom discipline seem to fall into two categories: those who can tolerate no disruption and those who feel disruption can be tolerated up to the point in which it begins to interfere with the achievement of nondisruptive students in the classroom.[2]

In examining teachers' attitude, Levine utilized the Indiana University Discipline Questionnaire in which teacher respondents were asked to state which of the discipline tactics he/she would never, almost never, sometimes, almost always, or always employ. There appeared to be an overwhelming acceptance of tactics incorporating rehabilitative features. The most highly rated of the fourteen tactics of discipline identified in the instrument was the individual pupil conference.[3]

The teacher's behavior may be a constructive force, or it may have a disintegrating effect.[4] In a study by Thomas the "approving teacher

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[1]George H. Gallup, "Seventh Annual Gallup Poll of Public Attitudes Toward Education," Phi Delta Kappan 57 (December 1975), 228.

[2]Odoro Ayllon and Michael Roberts, "Eliminating Discipline Problems by Strengthening Academic Performance." Journal of Applied Behavior Analysis 7 (Spring 1974): 71.

[3]Mary Anne Levine, "Are Teachers Becoming More Humane? Phi Delta Kappan, January 1978, p. 354.

[4]Ralph H. Ojemann, Personality Adjustment of Individual Children (Washington, DC. National Education Association, 1967), p. 6.

responses maintained appropriate classroom behavior while disruptive behavior increased each time approving teacher behavior was withdrawn."[5]

Jensen conducted a survey which showed that elementary-trained teachers were significantly more positive in their responses than were secondary-trained teachers in the sample. Elementary teachers had significantly more favorable attitudes toward a school-without-failure concept than did middle-school teachers. There was no differences to be found in measured attitude by sex, number of credits past a bachelor degree, or years of experience.[6]

Studies carried out by Kerlinger and his students show that two relatively orthogonal factors, progressiveism and traditionalism, underlie attitudes towards education. The subject matter and authority discipline areas are most often associated with traditionalism, and the interpersonal relations and normulative social areas are most associated with progressivism. Through the use of Q sorts, correlations and factor analysis, the factors "concern for pupil" and "structure and subject matter" emerged for both elementary and secondary teachers. The elementary teachers favored the "concern for pupil" over the "structure and subject matter" while the secondary teachers favored "structure and subject matter" over "concern for pupil." These factors, according to the author, underlie the progressivism/traditionalism dichotomy of teacher behavior.[7]

Kohr conducted a study of various teacher attitudes and usage of innovative classroom practices. The control variables were sex, educational level, experience, grade level, and community type.

> The data clearly states that the most positive attitude towards students, parents, fellow staff, and school administration are held by elementary school teachers. They report fewer problems affecting learning atmosphere and tend to use innovative practices more frequently than secondary teachers.[8]

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[5]Don R. Thomas, Wesley C. Becker, and Marianne Armstrong, "Production and Elimination of Disruptive Classroom Behavior by Systematically Varying Teacher's Behavior." Journal of Applied Behavior Analysis (Spring 1968, p. 43.

[6]Kenneth Jensen, Schools without Failure in Madison, Wisconsin (Bethesda, MD: ERIC Document Reproduction Service, ED 079 818, 1973), p. 5.

[7]Cunningham Holmes and Levon Winters, "Do Discipline Codes Really Work?" NASSP Newsletter, March 1978, p. 7.

[8]Richard L. Kohr, A Survey of Teacher Attitudes and Classroom Practices (Bethesda, MD: ERIC Document Reproduction Service, ED 139 839, 1977, p. 5.

The study appears to reflect a socialization process in which teachers, as they accrue time on the job, become less inclined to attempt innovative techniques and become more accepting of administration, facilities, and students.[9]

Willower developed instrumentation to ascertain pupil-control ideology on a humanistic-custodial continumm.

> A humanistic ideology holds that students are trustworthy and capable of self-discipline; its orientation towards pupils is one of permissiveness and sympathetic understanding.
>
> A custodial ideology views students as irresponsible persons who require strict regulation; its orientation toward pupils is moralistic and punitive.[10]

Willower uses a twenty-item, Likert-type instrument with a scoring range from twenty to one hundred--the higher the score the more custodial the responses. The pupil-control ideology (PCI) form when used by educators in elementary schools "has consistently been shown to be more humanistic in PCI than their secondary school counterparts.[11]

Other studies utilizing the PCI report that high-school teachers are the most custodial, junior-high teachers next, then middle-school teachers, and the least custodial are elementary teachers. One study reported that teachers became more custodial six months after they first began teaching.[12]

Another instrument was devised by Willower to be completed by students. This pupil-control behavior (PCB) was tested by Bulst to measure pupil-control behavior and found that the PCI and PCB were significantly related beyond the .01 level of significance. He also discovered that when the PCI was used to measure colleagues and principals, that "teacher perception of colleague and the principal's PCI were more custodial than the actual colleague or principal PCI.[13]

Schumann offers some suggestions in interviewing prospective teachers that he found successful. Discipline questions deal with discipline

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[9]Ibid., p. 7.

[10]D. J. Willower, "Some Comments on Inquires on Schools and Student Control," Teachers College Record 77 (1975): 33.

[11]Ibid., p. 35.

[12]Ibid., p. 37.

[13]Ross S. Bulst, "Perceived Organizational Press, Personal Ideology and Teacher-Pupil Control Behavior" (Doctoral dissertation, Pennsylvania State University, 1977), Dissertation Abstracts International 38 (1977): 3169.

problems to shed some light on a person who has a weak philosophical or practical base from which to operate. Schumann likes to ask how a candidate would handle various situations.

> A student evidently bored and showing it over several day's time span raises his hand and asks, "When are we going to do something in this class? Man is this boring."
>
> A student frequently wonders into a class late or often comes unprepared for work (without paper, pencil, or book).
>
> A student constantly shouts out answers to questions, often ignoring the fact that the teacher has called on someone else to respond. The teacher has cautioned him about this, but the behavior persists.[14]

"These are minor problems that should be handled in a 'low-key' way, and a candor suggestion for handling that should be multiple and appropriate in each case."[14]

The investigator for this study pursued the thesis that there was a method to determine differences in disciplinary styles of school teachers. This study proposed that the Behavioral Consequence Preference Survey (BCPS) would determine differences of teachers in their selection of consequences for reducing or eliminating the reoccurrence of inappropriate behaviors.

The major hypothesis of this study is stated as "the Behavioral Consequence Preference Survey will determine differences in disciplinary styles among school teachers."

1. Elementary-trained, middle-school teachers will be significantly more positive in their disciplinary style than secondary-trained, middle-school teachers.

2. There will be significant negative relationships between experience and disciplinary styles.

3. There will be significant positive relationships between consequences selected and type of undesirable behavior illustrated in vignettes.

The subjects in this study were inservice teachers employed by a public school system who are presently teaching in middle-school settings and preservice subjects presently in their last year of training for teacher cerfification. Some subjects were teaching in a middle-school setting with grades six, seven, and eight as the focus, whereas others were teaching in a setting which involved grades seven, eight, and nine.

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[14]Paul F. Schumann, "Questions and Administrator Should Ask," NASSP Bulletin, January 1977, p. 62.

[15]Ibid., p. 63.

A table of random numbers was used to select 320 inservice subjects from 110 middle and junior high schools in Kentucky. The remaining 80 subjects were selected preservice teachers in training at Western Kentucky University. Subjects chosen had varying degrees of experience--from preservice to over twenty-one years. The various levels of teacher education training of the subjects included elementary and secondary. The subjects were both male and female. No attempt was made to select subjects by sex, experience (exception of preservice), or training.

The Behavioral Consequence Preference Survey (BCPS) was developed by the author. The instrument consists of twenty vignettes describing situations which require disciplinary action by the subject. The subject is required to choose the one best action to take according to his/her beliefs and experiences, and yields a score which proports to exhibit a teacher's disciplinary style.

Consequences for inappropriate behavior (24) were solicited for this study from thirty-five middle-school teachers and one hundred middle-school students. This list of twenty-four consequences was then rated by thirteen persons with noted expertise in the fields of psychology, behavioral managment, counseling, and middle-school areas. The juror member's task was to rate each of the twenty-four consequences from one to nine (negative to positive) to demonstrate the degree of effectiveness of each consequence. The degree of effectiveness was judged by the jury members on the basis that the most effective consequence (nine), when utilized, would reduce or eliminate the reoccurrence of an inappropriate behavior. The least effective consequence (one) would produce little or no reduction of the reoccurrence of an inappropriate behavior.

A repeated measures analysis of variance (ANOVA) of the juror's ratings, utilizing Hoyt's reliability estimate, yielded an inter-rater reliability coefficient of seventy-nine ($\bar{r} = .79$). Means were established for each consequence from the jury's ratings and rounded to the nearest whole number.

The vignettes depicted modes of behavior found to be common by previous research within the middle-school setting. Four vignettes were written by this writer for each of the ten behavior modes: illmannered, cheating, lying, disobedient, aggression, destruction, annoying, vulgar language, rule breaking, and disruption. The forty vignettes were then randomly assigned an order position to better distribute the modes. Table I lists the consequences used in the instrument and the value of each as determined by the jury of experts.

There were two methods employed to collect the data for this study--personal contact and mail. All inservice teachers randomly selected from Kentucky's middle-school teacher population were mailed the instrument. All preservice teachers were selected from Tests and Measurement classes at Western Kentucky University. Professors of those classes distributed the instrument to each class member. Instructions for all subjects were the same.

In this study there were fifty-one variables analyzed as identified within the statistical package for social sciences computer programs. The dependent variables were in the various forms of vignette modes, quartile

TABLE I

CONSEQUENCES SELECTED FOR THE BEHAVIORAL CONSEQUENCE PREFERENCE SURVEY

Mean Value	Consequences	Mean Value	Consequences
1	Yell or "chew out"	6	Expressing disappointment
		6	Ignore
2	Send to principal		
2	Paddling	7	Reward only
		7	Refer to counselor
3	Extra school work	7	Parents called
3	Keep after school		
3	Not allowing to participate	8	Talk with student
		8	Resource room
4	Isolate		
4	Send out	9	Behavior contract
5	Assigned seating		
5	In-school suspension		
5	Withholding rewards		

rankings (styles), varimax factors, and author factors. The independent variables were in the forms of training, experience, and eight combinations of the two (TREXPCAT).

General frequency distributions with all descriptive statistics were run on variables one through fifty-one to determine means, variance, standard deviations, and to provide a means of viewing the data for patterns and unique statistics. An alpha method of reliability and a factor analysis of variables one through twenty also were computed.

In order to test hypothesis 1 (H_1), a two-way analysis of variance (ANOVA) was computed to determine relationships among the variables training, experience, and the dependent variables. The .05 level of significance was selected for existence of significant relationships. Factor A was designated as training, which consisted of two divisions--elementary and secondary. Factor B was designed as experience, which consisted of four divisions of years--preservice, one to five, six to ten, and eleven plus years.

Since there are only two levels of the training variable, significant main effects for this independent variable required no further analyses. However, where significant main effects for the experience factor were found, the TUKEY procedure was used to locate specific differences among the four levels. The TUKEY test for posteriori contrasts was chosen because of its capabilities for unequal group sizes.

The two-way ANOVA procedures yielded main effects for both the A factor (training) and the B factor (experience), as well as the interaction of the A and B factors. Where main effect for A was significant, no further analyses were used. If main effect for B was significant, the TUKEY pro-

cedure was computed. If the interaction between A and B (A x B) was significant, a one-way ANOVA was used on both elementary-trained and secondary-trained subjects at each level of experience. Those ANOVAs found to be significant were further analyzed utilizing the TUKEY procedure.

To test hypothesis 2 (H_2) quartiles were established from the BCPS scores to divide the scores into four groups. These four groupings were then analyzed with the four experience variables. The .05 level of significance was selected for existence of significant differences by use of an analysis of variance.

In order to test hypothesis 3 (H_3), a chi-square test of significance was used to determine any significant differences between vignette modes and value of consequences selected. The chi-square was used to test the relationship (independence) between the vignette mode and negative-positive position of chosen consequences.

If the chi-square results were found to be significant, each vignette mode was analyzed separately. For example, ILLMAN--the proportion of responses in each of the levels on the negative-positive dimensions were compared against the estimated frequency by chance. If the chi-square test was found to be significant, the vignette mode and negative-positive positions were not independent of each other.

The distribution of the frequencies of the TOTBEH20 (total score) variable is illustrated in Figure 1. The figure is a pictorial representa-

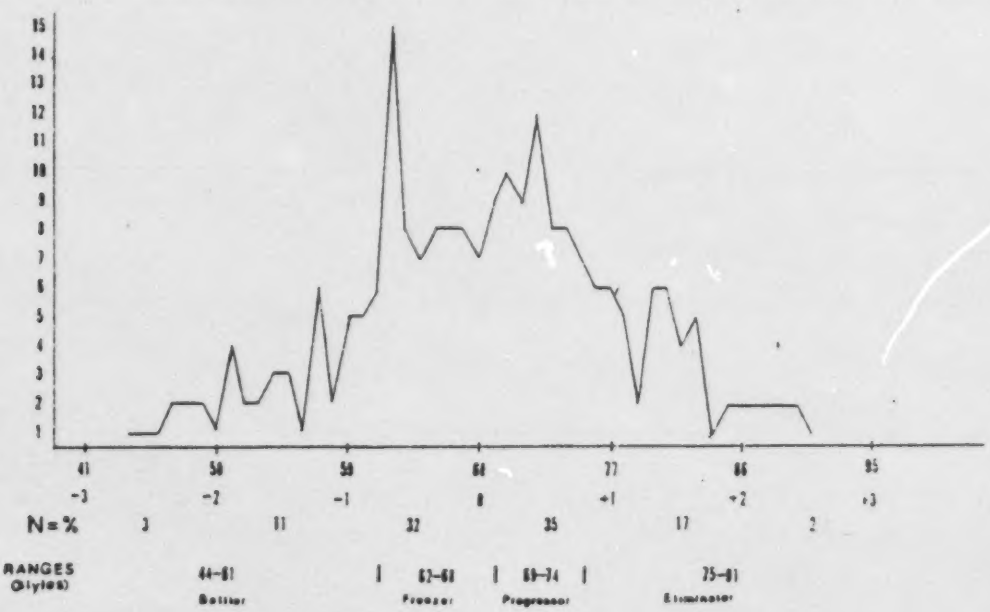

Figure 1 Distribution of the frequencies of TOTBEH20

tion of the frequency distribution of the BCPS scores in this study. The vertical axis indicates the frequency at which the scores (horizontal axis) occurred. From this frequency polygon, it can be determined that the mean

score was sixty-eight with a standard deviation of nine. Sixty-seven percent of this study's population scored between -1 and +1 standard deviation units. In this study there were 11% between -1 to -2 and 17% between +1 to +2, and 3% of the scores were between -2 to -3 and 2% were between +2 to +3 standard deviation units.

The RANGES (styles) included in Figure I indicate four divisions of the sample's scores by quartile ranking. The Battler (44-61) style approximately 25% of the sample who scored lower on the instrument than the other 75%. The Freezer (62-68) style indicated the next higher 25%, Progressor (69-74) style the next higher at 25%, and the Eliminator (75-91) style contained the 25% who scored the highest.

A varimax, orthogonal-rotation factor analysis simplified the twenty vignette mode variables into eight columns, or columns of a factor matrix. The variable loadings in each of the factors are listed in Table 2. The general statistics of each of the factors are illustrated in Table 3.

A two-way ANOVA was computed between the dependent variable DISCSTYL (discipline styles determined by quartile ranking) and the independent variables training (TRAINING) and experience (EXPERIEN). Main effects

TABLE 2

VARIABLE LOADINGS WITHIN VARIMAX FACTORS

Variable	Factor	Variable	Factor
LYTINGO1	01	CHEATNO2	02
DISOBDO2	01	AGGRESO2	02
ANNOYGO1	01	AGGRESO1	03
ANNOYGO2	01	DESTRUO1	03
VULGLNO1	01	VULGLNO2	04
DISRUPO1	01	DESTRUO1	04
KILBRKO2	01	DISOBDO1	07
CHEATNO1	05	LYTINGO2	07
KILBRKO1	05	TILMANO1	06
DESTRUO2	05	TILMANO1	08

for both TRAINING and EXPERIEN were found to be significant beyond the .05 level. Two-way interactions were found not be significant.

A one-way ANOVA between DISCSTYL and TRAINING revealed a statistically significant (.05) difference between elementary-trained (ELETRN) and secondary-trained (SECTRN) teachers. The ELETRN teachers were found to be significantly more positive in their disciplinary style than SECTRN teachers. The 95% confidence interval for the mean of ELETRN was 2.72 to 3.21 while the range of DISCSTYL is four. The TUKEY posteriori contrasts was not performed because there were only two groups within the TRAINING variable.

The one-way analysis of variance procedure was computed for the variables DISCSTYL and EXPERIEN. Statistically significant differences were found to exist beyond the .05 level, and the TUKEY procedure revealed that PRESER (preservice experience) was the group within EXPERIEN that was significantly different from the groups ONEFIVE (one to five years), SIXTEN (six to ten years), and ELEPLS (eleven plus years).

TABLE 3

STATISTICS CREATED FROM AN ANALYSIS OF VARIANCE BETWEEN DISCSTYL AND TREXPCAT

TREXPCAT Level	N	Mean	SD	SE	Conf.	Int.	(95)
PREELE	40	3.4	.78	.12	3.2	to	3.6
PRESEC	39	2.5	.91	.14	2.2	to	2.8
ONEELE	11	2.3	1.28	.39	1.5	to	3.2
ONESEC	34	2.2	1.12	.19	1.8	to	2.6
SIXELE	16	2.5	1.09	.27	1.9	to	3.1
SIXSEC	37	2.2	1.04	.17	1.8	to	2.5
ELELE	12	2.6	1.24	.36	1.8	to	3.4
ELESEC	27	2.1	.94	.18	1.8	to	2.5
Total	216	2.5	1.09	.07	2.4	to	2.7

TRAINING and EXPERIEN were combined to create the variable TREXPCAT which consisted of eight levels (two levels of training for each of the four levels of experience). The TREXPCAT variables are (1) PREELE--preservice, elementary-trained, (2) PRESEC--preservice, secondary-trained, (4) ONESEC--one to five years, secondary-trained, (5) SIXELE--six to ten years experience, elementary-trained, (6) SIXSEC--six to ten years, secondary-trained, (7) ELELE--eleven plus years experience, elementary-trained, and (8) ELESEC--eleven plus years, secondary-trained. A one-way ANOVA between DISCSTYL and TREXPCAT yielded statistically significant differences ($p = 0.000$). The TUKEY procedure found the mean of the PREELE level of TREXPCAT to be significantly different from the means of the other seven groups. The statistics yielded by this analysis of variance are listed in Table 3.

The one-way analysis of variance procedure was computed between each of the dependent variables FACTOR01 through FACTOR08 and the independent variable TREXPCAT. Varimax factors FACTOR01 ($p = 0.000$), FACTOR02 ($p = .029$), and FACTOR07 ($p = 0.031$) were found to have significant mean differences. The TUKEY procedure found the significance between the groups was in the PREELE level in factors FACTOR01 and FACTOR07. FACTOR02 did not yield two groups being significantly different at the .05 level; in each case PREELE scored higher than the other groups.

The variables TOTBEH20 (total score) and TREXPCAT were analyzed by an analysis of variance. As shown in Table 4, PREELE (preservice, elementary

trained) achieved a significantly higher mean than the other TREXPCAT levels. This analysis of variance was statistically significant beyond the .05 level ($p = 0.000$). The TUKEY test revealed PREELE as being significantly different from the other groups within the TREXPCAT variable.

TABLE 4

STATISTICS CREATED FROM AN ANALYSIS OF VARIANCE--BETWEEN TOTBEH20 AND TREXPCAT

TREXPCAT Level	N	Mean	SD	SE	Conf.	Int.	(95)
PREELE	40	75.5	7.10	1.12	73.2	to	77.7
PRESEC	39	68.6	7.50	1.20	66.2	to	71.1
ONEELE	11	66.5	10.20	3.10	59.6	to	73.5
ONESEC	34	66.0	9.40	1.61	62.7	to	69.3
SDOELE	16	67.1	10.80	2.69	61.4	to	72.9
SDOSEC	37	65.0	8.92	1.47	62.0	to	67.9
ELEELE	12	66.9	10.22	2.95	60.4	to	73.4
ELESEC	27	65.2	7.10	1.36	62.4	to	68.0
Total	216	68.1	9.18	.62	66.9	to	69.4

The dependent variables FACTOR01, FACTOR02, FACTOR07, and ORDREL (order related) yielded results that more closely approximated a normal curve distribution than any of the other groups of variables. The author selected the best items (not duplicating vignette modes) from these four groups and added the next best item outside these groups to complete a set of ten vignettes to construct a shorter form of the instrument (alpha reliability coefficient = .53; split half = .76). Each of these variables yielded a statistically significant correlation beyond the .0001 level computed by a Pearson product moment, when each was correlated with the total of the revised instrument (TOTBEH10--of the BCPS Form Short). The frequency distribution is illustrated in Figure 2.

The DISCSTYL distribution between TOTBEH20 (total score of long form) and TOTBEH10 (total score of short form) remained within one subject for styles BATTLER (most negative style) and ELIMINATOR (most positive style), two subjects for PROGRESSOR (next to the most positive style), and four subjects for FREEZER (next to most negative style). This difference involved seven subjects distributed over four styles. Since all DISCSTYL-related data have been previously presented and the most statistically significant vignettes were selected for BCPS Form S, no data relating to DISCSTYL and the independent variables are presented.

The behavior categories, discipline styles, training, experience, and BCPS Form S were combined to profile a teacher's attitude concerning discipline. Each subject's discipline style profile considers training and experience levels. Raw scores are used to profile a teacher's discipline style.

The chi-square test of independence was used to determine if there was independence among the vignette modes in their scoring. The data consisted of a frequency count of scores one through five which was tabulated and placed in the appropriate cells. Since the vignette modes were independent, and the data were in terms of frequencies in discrete categories, the chi-square test of independence was the appropriate statistical test.

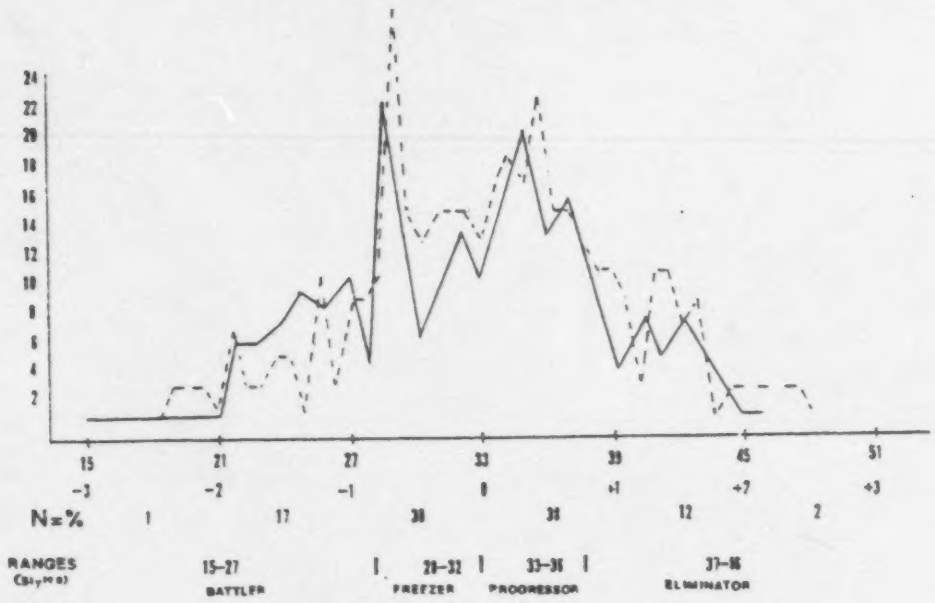

Figure 2. Distribution of the frequencies of TOTBEH10 and TOTBEH20.

The phi coefficient was also computed to determine the degree of significance--a measure of strength of relationship. A large value (closer to +1) signifies a high degree of association exists. The vignette modes ILLMAN, CHEATN, ANNOYG, VULGLN, RULBRK were found to be significantly independent.

To test the significance of relationship between the jurors' means and sample means, the sample means were rounded to the nearest whole number. This number was then matched with the appropriate consequence within each vignette and recorded as the value (one through nine) assigned to that particular consequence by jurors. In testing the homogeneity of the two variances, the F ratio equaled 1.2446, which was well within the .05 level of the F value. The two groups' variances do not differ significantly from each other. The 9/9 degrees of freedom critical value at .05 level is 2.18; therefore, the null hypothesis failed to be rejected. To test the statistical significance of the means of jurors and the teacher sample, a t test was computed (t = .1162). The t value for rejecting the null hypothesis with eighteen degrees of freedom was 2.101. The null hypothesis failed to be rejected.

Four discipline styles were developed along a continuum from negative to positive--Battler, Freezer, Progressor, and Eliminator. The assumption founding the names was that as the teacher's disciplinary style became

more positive (higher score), the higher possibility of eliminating (Eliminator) the undesirable behavior. The analysis demonstrated no significant differences of means among the dependent variables and independent variables with the exception of preservice, elementary-trained, middle-school teachers, who consistently scored significantly higher than any other group in the sample.

It was concluded that the instrument (both long and short forms) can be used to determine disciplinary styles of teachers (near normal curve within sample). The instrument may be most effective when the profile scoring sheet matches the training and experience levels of the subject. It is suggested that the disciplinary style profile be used as supplementary to the interview and/or assessment processes. The BCPS is designed to assist the administrator in his/her needs for employment and inservice assessment. The reliability (.76) and validity (.92) of the instrument are such as to be regarded worthy of an administrator's usage.

A more thorough investigation of the variables sex, age, and philosophy should be conducted. It might be assumed that a philosophy of human nature would be more positively correlated with discipline style than any other variable. It is, therefore, recommended that a study assessing the disciplinary style along with the assessment of philosophical modes be highly considered by researchers. Also worthy of research is an examination of the similarities and differences between Willower's humanistic-custodial (PCI) scale and the BCPS.

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Teacher Reacting Moves and Subsequent Student Participation in Ninth Grade Algebra Classes

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Classrooms are characterized by talk; teachers talk and students talk. The interrelationships among the various kinds of talk are not clearly understood. This field study was undertaken for the purpose of seeking evidence of relationships between student participation, defined here as student response to teacher questions about the subject matter, and teacher reacting moves, defined by Bellack and others (1966) as verbal activities which serve to modify or to rate a student's response. A secondary consideration for this study was an attempt to specify the purpose of the interactions, utilize individual students as the unit of analysis, and control such context variables as grade level, subject matter and activity.

The recitation, characterized by the teacher question-student response-teacher reaction cycle, has been described as persistent and pervasive (Hoetker and Ahlbrand, 1969 and Zahorik, 1968). For the educator interested in recitation variables with populations above the 8th grade level, a review of the literature provides very little useable information. Most studies are based on elementary school populations, the dominant unit of analysis is the teacher or class as a whole, and the research paradigm employed attempts to relate teacher reactions to student product outcomes.

Teacher reacting moves are reported by Bellack and others (1966) as comprising 39 per cent of all teacher moves. Other authors studying secondary school students have quantified student talk. Dahllöf and Lundgren (1970) found that in secondary math classes in Sweden student talk occupies one tenth to one fifth of the class time. Student initiated talk occupies less than one tenth of the time. It is noted that "student talk" refers to any student utterance, whether it is on-task or not.

Attempts to relate reacting moves to student talk have indicated that "indirect" behavior (the use of praise or encouragement or the use of student ideas or feelings), a concept pioneered by Flanders (1965), is related to student talk. Johns (1966) found that indirectness was related to greater levels of student initiation. Sprague (1971), using a Flanders-like instrument, found that indirect behaviors were associated with increased levels of student talk.

The unit of analysis usually employed is the teacher or the class as a whole. Jackson and Ladaherne (1967), Good and Brophy (1971), and Brophy and Evertson (1976) all acknowledge the need to examine relationships between individual students and the teacher in interaction studies.

Research in interaction patterns and relationships has been dominated by the process-product paradigm. Reviewers of studies in that research tradition have been unable to offer prescriptions for teacher reacting behavior (Duncan and Biddle, 1974; Rosenshine, 1971, 1976; and Medley, 1977), especially at the upper grade levels.

The present study sought evidence of relationships between teacher reacting moves and student verbal participation. It was thought that teacher reactions which provided students with cognitive feedback or which offered evaluation would be associated with higher levels of participation. Thus the hypothesis:

> Informing and/or Rating reactions are followed by student initiated participation significantly more often than are Neutral and/or Ignores reactions.

In view of evidence of reciprocity of influence in classrooms (Fiedler, 1975; Noble and Nolan, 1976; and Copeland, 1978), it was thought that teachers would respond more thoughtfully to student initiated responses than to responses the teacher had solicited.

> Hypothesis 2: Student initiated participation is followed by Informing and/or Rating reactions significantly more often than is teacher solicited participation.

Whether a teacher reaction serves to reinforce student participation depends upon the individual student. No one reaction can be reinforcing to all students. An attributional approach suggests that various reactions would be differentially effective (Weiner, 1976). Because, in the rather rapid pace of most classrooms, it is difficult for a teacher to know which student will respond to which reaction, it was suspected that students who receive some reactions which informed or rated would participate more frequently than students whose responses were merely acknowledged or even ignored.

> Hypothesis 3: Students who receive Informing and/or Rating reactions as well as Neutral and/or Ignores will participate significantly more often than students who receive only Neutral and/or Ignores reactions.

Finally, the folklore of teaching holds that either girls talk more than boys or that adolescent girls , not wanting to show off their ability in academic subjects, talk less than boys. Furthermore, or perhaps, on the other hand, smart kids do all the talking. In order to assess the effects of teacher reacting moves while statistically controlling the effects of sex and prior math achievement on student participation, a fourth hypothesis was tested.

> Teacher reacting moves will be positively correlated with student participation when previous math achievement and sex are statistically controlled.

Method

Setting

The setting for this study was four attendance centers in two contiguous K-12 school districts in a midwestern industrial state. School District A is located in a small industrial city; School District B serves four small suburban communities and adjacent rural areas. The population served by the school districts ranges from rural and urban poor to upper middle class professional families. Workers are employed in service occupations or in local industries. Many are

employed in a nearby major metropolitan area. The two school districts enroll twenty five (25) per cent of all ninth graders in the county, which is one of the largest population centers in the southern part of the state.

Subjects

Subjects in the study include seven ninth grade algebra teachers and 209 of their students. Eight algebra teachers are employed by the two districts. All were invited to participate in the study; one refused. In order to maintain a sample of 200 students, one teacher was observed in two separate classes. All teachers in the sample have a minimum of five (5) years experience teaching algebra to ninth graders; most have more. Of the 209 students, 98 are male and 111 female. Students are distributed fairly evenly by sex over the eight classes included in the study. Total Math scores on the California Achievement Test administered during the eighth grade were subjected to a t-test for independent groups. The results indicate the achievement means for the sexes are not significantly different. $t(134) = -.45$, $p. < .654$. It should be noted that achievement data were made available for 135 of the 209 students in the sample.

Neither teachers nor students were randomly selected for inclusion in this study. It is, however, believed that the students are representative of the population of ninth graders in these two school districts.

Students are assigned to the algebra class which best accomodates his or her overall course load. Assignments are made by computer and no attempt is made at "grouping" the students.

Table 1
Analysis of Variance - Achievement by Building

Source	df	SS	MS	F	
Between	2	116571.595	58285.798	31.472	p. < .001
Within	133	246316.140	1852.001		

Tukey HSD Procedure
Subset 1
Group 1 Mean 597.66
Subset 2
Group 2 Mean 616.153
Subset 3
Group 3 Mean 656.129

It is noted that classes were significantly different between but not within buildings.

Specific classes were selected for observation on the basis of observer convenience. For example, if two teachers in a building taught algebra in consecutive periods, those classes were chosen.

Similarly, if the observer had to travel between buildings, travel time became a consideration in scheduling.

Instrumentation

Three instruments were employed in the data collection for this study. Achievement data consists of the scale score for Total Math on the California Achievement Tests, Form C, Level 18, 1978 Edition (CAT/C). This test was administered during the eighth grade year by personnel employed by the school districts. The publisher of the CAT/C asserts content validity on the basis of the test construction procedures employed and reports test-retest reliability of .83 for two to three week intervals and .85 for Fall-Spring intervals (Technical Bulletin I, 1979).

Teacher verbal feedback behavior was coded using twelve teacher feedback reaction categories of the Brophy-Good Dyadic Interaction System (1969). The categories used were:

Praise correct response
Affirm correct response
No feedback
Negates incorrect response
Criticism
Process feedback
Gives answer
Asks other
Repeats question
Rephrase or clue
New question

The twelfth category, develops, was added as suggested by the authors (Brophy and Good, 1969) when coding classes with older students.

Interrater reliability with the teacher feedback categories of the Brophy-Good System was established. The investigator and a teacher trained in the use of observation systems independently coded four forty minute tapescripts which had been prepared for another observational study. The tapescripts yielded a total of 195 teacher feedback reactions to student responses to teacher questions. A Scott (1955) reliability coefficient of .95 was achieved.

The scope of the research included not only teacher verbal feedback, but also, in the absence of a verbal reaction, those nonverbal behaviors known as emblems. Emblems are intentional cognates of verbal behavior which serve to communicate specific messages between members of the same culture. For the purposes of this investigation the following emblems were coded:

Stop
Go ahead
OK
No and I agree
Yes, I agree and I like it

The above five emblems were verified as being correctly decoded and identified as having natural usage by at least 70 per cent of the respondents in a study of American emblems (Johnson, Ekman and Friesen, 1975).

Procedure

The eight algebra classes were observed on four consecutive days during the fall semester. Originally it was planned to include five class sessions as a period sufficient to stablize observer effect and provide an adequate sample of classroom behavior (Hudgins and Ahlbrand, 1969). Due to teacher illness early in the observation schedule, the four period sequence was substituted.

Classes were both audiotaped and observed. The observer was seated to the teacher's left and out of the line of sight of the students. Using a seating chart and stopwatch, the observer recorded a) the time of each student response to a teacher question, b) whether the student raised his or her hand or called out or whether the teacher called on a student who had not raised his or her hand, and c) the presence of an emblem in the absence of a verbal teacher reaction.

Audiotapes were converted to tapescripts. Using the seating chart and stopwatch, the investigator identified the speakers and whether the response was initiated or solicited. All students were assigned pseudonyms to protect their rights to privacy. These pseudonyms were used throughout the study.

Coding of the tapescripts involved several steps. Instances of student talk where the student could not be identified were not included in the coding and subsequent analyses. Identifiable student talk was coded as being:

Student initiated - student initiates by raising his or her hand or by calling out a response to a teacher question about subject matter.
Teacher solicited - teacher calls on a student who has not raised his or her hand to respond to a question about the subject matter.
Nonsolicited - student asks a question or makes a comment about the subject matter.
Other - all other student talk not directed to the subject matter.

Participation is defined as student verbal response to teacher questions about the subject matter. This restriction is made to specify the purpose of the interaction and to avoid confusing on-task responses with extraneous talk.

The next step involved coding those teacher reactions which immediately followed student initiated or teacher solicited responses according to the Brophy-Good categories. Upon completion of this coding the teacher feedback reactions were grouped and recoded according to the following:

INFORMS (In) - may be positive or negative but characterized by informing the student of the standard of correctness or appropriateness; may include rating if the criterion for evaluation is made public in the move; includes probing questions and development.

RATES (R) - may be positive or negative but characterized by evaluating without revealing the criterion for evaluation; includes sarcasm and other derogatory remarks.
NEUTRAL (N) - neither informing nor rating; accepting or rejecting a response without elaboration.
IGNORES (Ig) - goes on to another move without acknowledging student's response.

These categories were a result of classifying teacher feedback reactions as serving to provide information which enables the student to know the standard against which his response is measured; to provide an affective reinforcement; or simply to acknowledge the student's response.

Figure 1. Teacher Feedback Reactions Categorized as Teacher Reacting Moves.

	Teacher Reacting Move Categories			
	In	R	N	Ig
Feedback Reactions	Process feedback Rephrase or clue Develops	Praise Criticism	Affirmation of correct response Negation of incorrect response Gives answer New question Repeats question	No feedback reaction Asks others

After recoding the teacher feedback reactions as the appropriate teacher reacting move, teacher reacting moves and instances of student participation are transferred to a seating chart in sequential order. The terminal interaction is coded NSR (no subsequent response). Interactions are tied and treated as ordered pairs. The ordered pairs are then entered into one of two matrices. The first matrix, teacher reacting moves followed by student verbal participation has as columns the four categories of teacher reacting moves and as rows, student initiated, teacher solicited and no subsequent response. The second matrix has student participation as the columns and teacher reacting moves as rows. These matrices provide the data base for testing the first two hypotheses.

Data for individual teachers and students were pooled and converted to standard scores in order to ensure comparability within the constraints of differing amounts of time available to each class. These standard scores provide the data for testing the third and fourth hypotheses.

Data Analysis

The first two hypotheses were tested by the use of the chi-square test for k independent samples followed by the contingency coefficient test for association (Siegel, 1956). The two matrices served as the data base for these tests.

To test the third hypothesis students who had participated during the observation period were separated into two groups: those who received at least one instance of Informing and/or Rating reactions and those who received only Neutral and/or Ignores reactions. The participation means for the two groups were compared through the use of the t-test for independent groups. ω^2, a statistical procedure for estimating the proportion of variance of the dependent variable accounted for by a given independent variable (Schutz, 1966) was applied to the resultant t.

Finally, analysis of covariance was performed through the use of the multiple linear regression model to test the final hypothesis. Student sex and prior math achievement were included as covariates in the full model as were the two-and three-way interaction terms. The teacher reacting moves served as the factors in the analysis.

Results

The matrix of teacher reacting moves followed by student verbal participation yielded $\chi^2 = 29.404$, $p. < .001$. The contingency coefficient test for association, with an upper limit in this instance of .816, provides C = .163, a low to moderate degree of association.

Table 2
Chi-square Table for
Teacher Reacting Moves Followed by Student Verbal Response

	In	R	N	Ig	Total
Initiated	63	13	145	88	309
Solicited	113	34	363	132	642
No Subsequent Response	41	7	46	39	133
Totals	217	54	554	259	1084

$\chi^2 = 29.404$, 6 df, $p. < .001$

Examination of the discrepant cells, however, reveals that the significant association is between Neutral and/or Ignores reactions and student initiated participation. For the sample tested, Informing and/or Rating reactions are not associated with higher levels of student participation and the hypothesis is rejected.

The second matrix, student verbal participation followed by teacher reacting moves, yielded $\chi^2 = 13.22$, $p. < .01$. $C = .118$ with an upper limit of .707. Here again, although there is a low level of association among the variables, examination of the discrepant cells indicates that it is teacher solicited response which is more closely associated with Informing reactions. The initiated responses are followed by Rating or Ignores reactions more frequently than can be attributed to chance. Thus the hypothesis is partically supported. Student initiated responses are followed significantly more often by Rating reactions but not by Informing reactions than are teacher solicited responses.

Table 3
Chi-square Table for
Student Verbal Response Followed by Teacher Reacting Move

	Initiated	Solicited	Totals
Informs	71	146	217
Rates	10	44	54
Neutral	173	381	554
Ignores	106	153	259
Totals	360	724	1084

$\chi^2 = 13.22$, 3 df, $p. < .01$

The t-test for independent groups yielded $t(131) = -4.43$, $p. < .001$. $\omega^2 = .12$, indicating that twelve (12) per cent of the variance in student participation may be attributed to the presence of Informing and/or Rating moves. Hypothesis 3 is supported by the data. Students who receive some level of Informing and/or Rating moves participate significantly more often than do students who receive only Neutral and/or Ignores reactions.

The multiple linear regression analysis indicates that knowledge of student sex and prior math achievement do not significantly increase the amount of variance explained by the presence of teacher reacting moves. It should be noted that sex and math achievement account for less than one (1) per cent of the variance; while teacher reacting moves account for about seven (7) per cent when R^2 is adjusted for sample size and the number of variables in the equation.

Table 4
Analysis of Variance - Full and Restricted Models

Source	df	MS	F	
Full Model	14	.0107	1.152	not significant
Restricted Model	80	.0093		

Summary and Discussion

Eight classes of ninth grade algebra students were observed four class periods each. During that time student verbal responses and teacher reacting moves were recorded and coded. Analyses of the data indicate that specific reacting moves and student participation are weakly related. Students in this study tended to initiate significantly more often following a Neutral or Ignores reaction; teachers tended to rate or ignore student initiated responses significantly more often than solicited responses; students who received Informing and/or Rating reactions during the observation period tended to participate significantly more frequently than students who received only Neutral and/or Ignores reactions; and knowledge of student sex and prior math achievement do not significantly increase the variance which can be explained by the presence of teacher reacting moves.

Although chi-square analyses of the two matrices indicate significant degrees of association among the cells, it came as a surprise to the investigator that the associations were not those anticipated. It was anticipated that a student who received information about the appropriateness of his or her response or received a rating reaction would be more likely to continue participating. The results, however, indicate the opposite. It was also thought that teachers would want students to initiate responses and would be especially thoughtful about reacting to those responses. The data partially support this notion; teachers tended to rate or ignore student initiated responses more frequently than those they had solicited.

The relatively high amount of variance accounted for by the presence of Informing and/or Rating reactions on student participation is congruent with the fact that student populations are made up of diverse individuals. It may be that if a specific teacher reaction reinforces a student's verbal participation, the variable ratio serves to encourage the student to continue participating. For those students who receive neither evaluation nor information from the teacher, subsequent participation becomes less likely.

Finally, although the variance in participation which can be accounted for by teacher reacting moves is moderate, it is greater than that which is attributable to sex and prior math achievement. The teacher's reactions to student responses do make some difference. The most significant finding of this study is that variety in the use of feedback appears to be an effective way of increasing participation.

That talk is a dominant feature of classrooms has been demonstrated. The educational belief system supports the notion that the teacher's reaction to a student's response is important. Teachers have both seen this behavior modeled by their own teachers and been taught in methods classes to react to student responses.

There is, obviously, a need for further study of the phenomenon of student participation and the effects of teacher reacting moves. In the meantime, teacher educators, especially those responsible for preparing junior and senior high school teachers, have a minimal research base on which to build programs. The implications of this study for those teacher educators must be tentative. The role of the

teacher-as-reactor might be reconsidered. One may question the sheer volume of reacting moves and suggest that teachers simply wait a bit. Secondly, the emphasis on praise or positive reinforcement or whatever the current catchword is might be diminished. Since the classroom is populated by many individuals, a variety of reactions seems appropriate. A reinforcement is, by definition, that which increases the probability of a behavior recurring. No single reaction can always be labeled "positive reinforcement." "Terrific!" may be encouraging to one student and totally inappropriate to another. Not all student responses are praiseworthy. Reliance on a few reactions cannot meet the needs of all of the students in a class. Finally, if student participation is viewed as a positive feature of the instructional process, as an opportunity for students to gain skill in verbal communication as well as practice in the subject area, greater involvement of students in that process is a worthy goal. In addition to acquiring and using a large repertoire of reacting behaviors, teachers should be encouraged to make it a practice of calling on nonvolunteers, not as a management technique to keep them on their toes, but as providing an opportunity to gain skill in verbal communication.

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AN ANALYSIS OF MIDDLE-GRADE SCIENCE TEACHER QUESTIONING BEHAVIOR: IMPLICATIONS FOR STRUCTURING STUDENT RESPONSES

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The original thrust of the investigation was the belief that students tend to ask the same level of questions as those asked by their teachers. If we are to raise the level of student questioning behavior, particularly in higher-order questioning, the teachers would need to ask more higher-order questions during instruction.

Survey of Relevant Literature

The modeling of questioning by the teacher for the student, suggests (Helfeldt and Lalik, 1976), that reciprocal student-teacher questioning procedures are more effective than unilateral teacher questioning procedures. Donlan (1978) supports this in his research saying:

> . . . it is better to construct higher-level questions first, then fashion enabling questions on succeedingly lower levels.

This concept implies not only the need and use of higher-order questioning, but the reverse of traditional thinking which is to move from informational levels of questioning to higher orders. Kneip and Grossman (1977) stated results of their work to be consistent with previous findings, i.e., Kneip (1977b), Ryan (1973), and Ryan (1974). In summary they state:

> . . . the use of predominantly high level questions is an effective strategy for moving students toward low and high levels of understandings.

Martin (1979) cites in his work research that a blending of both high and low-order questions has a more beneficial effect on student achievement than

higher-order questions alone. In McDaniel's (1979) work his emphasis is on the asking of "better" questions. Among the strategies suggested was the use of higher-order questioning to elicit higher-order responses from students.

On the other side of the questioning issue, Dillon (1978) suggests that present accepted strategies may suppress student thought more than it helps. He further states:

> We have only a slim basis for asserting that any questioning strategy affects student behavior positively . . . It is not known what questions do, consequently the place of questions in educational thought, practice and research comes to rest ultimately on the strength of mere assertion.

These assertions about the neutral, if not negative results of present questioning practices, are tempered somewhat by Dillon's (1979) offering of alternatives to questioning. He states these alternatives to questioning "will not entirely replace questions but they can serve as substitutes and supplements." On a similar note Gall, et al (1978) suggests from their work that the factual teaching (questioning) produced higher scores on tests than did the higher-order teaching (questioning) groups. From the author's experience or perspective the type of test used may program the types of teaching that are best, i.e., facts quizzed -- facts taught, concepts quizzed -- concepts taught.

Another aspect discovered by this research was that during the first week teachers asked 80 percent of the questions (54 percent factual types) and during the last week this had fallen to 54 percent (24 percent factual). Hargie (1978) found 54 percent factual questions being asked in classroom during instruction. Gallager (1965) found 50 percent. Davis and Tinsley (1967), Bartolome (1969) and Gall (1970) found similar results. Reasons for this emphasis on factual recall technique are suggested as due to design of the curriculum and its content plus the ways (teachers) use and phrase questions (Napell, 1978).

Partin (1979) suggests the need for monitoring (self) and practice to improve the quality of questioning skills. This work suggests the need for monitoring and awareness development in the area of questioning skills as an effort toward improving student responses and hopefully learning. With the changes in science curriculum which surfaced during the sixties and seventies, the emphasis on the processes of science became the important criteria. Keeping this in mind, the efforts to move to a greater depth of understanding by students must involve more than rote learning. To conceptualize one must ask higher-order questions. If this is truly a goal of learning in science, then monitoring and awareness development in the area of questioning skills is needed.

Statement of the Problem

The research question posed was: Are the types of question responses by students influenced by the types of questions used by teachers?

Procedure

For the purposes of this study, questions were monitored in three category for both the teacher and the students. These categories are: (1) low-level-cognitive (informational), (2) higher-order (comprehension to evaluation) and (3) non-topic (unrelated to the discussion). This study attempted to quantify and categorize the types of questions teachers asked and the responses (in terms of the form of additional questions) that students asked.

Data

The study involved eleven middle-grade science teachers (earth science, life science and physical science content areas) in the Dallas-Fort Worth metroplex area. A total of 53 observations were made in classes over a

period of five to eight weeks. After each observation, teachers were made aware of the tabulations in each category and encouraged to incorporate more higher-order questions in their lesson presentations.

In the initial week of observations the following results were tabulated:

Types of Questions	Responses	
	Teachers	Students
Low-Level Cognitive	72	61
Higher-Order	29	1
Non-Topic	5	13
Totals	106	75

This data indicates that during the first week of observation both the teachers and the students asked more informational (low-level cognitive) questions than higher-order questions.

The last week of the observation in each classroom resulted in the following findings:

Types of Questions	Responses	
	Teachers	Students
Low-Level Cognitive	85	82
Higher-Order	91	77
Non-Topic	17	3
Totals	193	162

Even though the number of weeks for each observation period varies from five to eight weeks, the results of the last week of observation indicate that as teachers increased the number of questions they asked, the students correspondingly increased the number of questions they asked. A higher percentage was recorded the last week in each cognitive category for both teachers and students.

Analysis of the data using a Student t test showed the only significant changes were in the teacher higher-order and the student higher-order questions. Both were significant at the .05 level. See the following tables for further explanation:

	First Week		Last Week		
Questions	$\bar{x}$	Σx^2	$\bar{x}$	Σx^2	t
Teachers: Low-Level	6.55	174.75	7.73	246.29	.603
Higher-Order	2.64	80.66	8.27	328.23	2.920*
Non-Topic	0.45	2.75	1.55	46.75	1.639
Students: Low-Level	5.55	76.75	7.45	282.75	1.051
Higher-Order	0.09	0.91	7.00	124.00	6.482*
Non-Topic	1.18	89.62	0.27	4.11	.986

df = 20

*.05 = 2.086

Further study is needed and intended for applications as to impact on the retention of information - both factual and conceptual. Another area for consideration is the affective realm. Martin's (1979) work suggests negative responses to the teacher even though higher-order questions by teacher produced higher-order question responses from students.

In the area of test questions, Funk (1977) found in his work that most standardized tests sought primarily knowledge-level types of answers. Perhaps the types of tests most often used do seek lower-level responses and students feel frustration in classroom discussions which differ greatly with the styles of instruments used in course accountability. In other words, if these attitudes are present and relevant, more time must be spent in initiating classroom dialogue techniques and evaluation instruments that are congruent.

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WILL DIFFERENTIATION OF INSTRUCTION HELP MIDDLE SCHOOL STUDENTS ACHIEVE AT LEVELS HIGHER THAN THEIR EXPECTED PACE?

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Teachers of older students often wonder aloud why junior high and secondary school students reach that advanced level without being able to read. Teachers at the middle levels look even lower for the source of the problem. Since reading instruction consumes the greater part of the day in primary grades,[1] negligence can hardly be cited. An examination of trends in the standardized test scores of students reveals a sometimes dramatic drop for many of them in the middle grades. Several reasons have been proposed for the decrease. Among these is the failure of middle grade students to apply the basic reading skills which were mastered earlier to their content studies - the math, science, and social studies. They are not transferring prior training.[2] Another cause is the schools' de-emphasis of basic reading skills development in grades four, five, and six even though the basic "how to read" skills continue to develop until a student reaches an overall reading ability at the sixth level.[3] The language and educational deprivation of disadvantaged students also begins to take its toll in lowered achievement at the middle levels.[4] New program development usually focuses upon the primary or secondary level student. Major funding for instructional development has also been more supportive of the primary and secondary programs. In a sense the middle grades could be labeled the "forgotten grades." These are the grades in which many students lose their way academically and never recover

The Problem

Analysis of reading achievement in Moore County for the 1976-77 school year revealed that more than fifty percent of all students in grades four through eight were one or more years retarded in reading development. Closer inspection revealed that students in these middle grades were participating in a Language Arts Program which often emphasized oral language, grammar and spelling skills. Reading instruction in these middle grades tended to be integrated into the larger language arts block. Because teachers assumed that students were already reading at an adequate level, specific development of reading skills frequently did not receive major emphasis in such programs. The teachers' knowledge of how to alleviate the reading difficulties of students in the classroom was often weak and parental support, minimal. Students within these programs demonstrated progress but not in keeping with expectation.

Because of these factors, the design of a model middle school language program which emphasized direct instruction in reading became paramount. However, the state of North Carolina had provided funding only for primary level programs. With aid from a federal Right to Read grant Moore County conducted a three year study to provide a base for developing such a model program.

Hypotheses for the Study

The assumption is often made that school programs which identify individual student needs and prescribe appropriate instruction should produce a greater degree of learning for each student. This study sought to determine if:

1. Middle school students whose reading instructional program is differentiated according to strengths and weaknesses identified at the beginning

of the school year will exceed their prior pace of development in programs that were based upon standardized survey test results from the previous year and reading record cards.

2. Middle school students who are placed in reading programs that are differentiated yearly will exhibit an increase in favorable attitudes toward their own self-worth as a learner.

Study Population

Students from a total of twelve selected classes, three from each of grades five, six, seven, and eight, at the Aberdeen and Southern Pines Middle Schools of Moore County, North Carolina, served as subjects for the Pilot study, 1977-78. These same level classes plus three from grade four comprised the study populations for the 1978-79 and 1979-80 studies. Two new schools, the West End Middle and Pinehurst Middle School, joined the program in the 1978-79 year and remained through the end of the study. One class from each of grades four through eight in each new school joined in the study. The criteria for selection of schools was that the school and individual classes have a high percentage of reading disability as well as permit a wide coverage of grades and that the study would have full acceptance by the school's administration, faculty, and parents. All classes within each grade were heterogeneously grouped. Only the scores of students who remain in the consecutive programs were analyzed. Two major socio-economic levels were identified within the population, 1) rural tenant farmers' children and 2) the affluent children of Southern Pines and Pinehurst, golfing resort towns. The ratio of black to white children participating in the study was proportional to that of general population of Moore County. Tobacco farming and golfing were the major sources of income for the children's parents.

Research Design and Procedures

This study which sought to determine whether middle school children could exceed their prior growth rates extended over a three year period, 1977-78, 1978-79, 1979-80. In the fall of each year all students were pretested using the upper levels of the Prescriptive Reading Inventory and its companion test, the ORBIT, for middle and upper level students, The California Reading Test, and the Piers-Harris Self Concept Scale. These tests determined student strengths, weaknesses and attitudes which were used as the bases for instructional planning. In the spring of each year when instruction had been completed, the students were post tested using alternate forms of these tests. Questionnaires were completed by the students to assess their opinions of growth made during diagnostic-prescriptive instruction and to help given by volunteers.

The conditions which the study sought to promote were 1) provision of individual help and attention for each student, 2) provision of time and motivation to assure that each student practiced the skills taught, 3) provision for the classroom teacher to participate fully in the design of diagnostic-prescriptive program for teaching reading in the middle schools, 4) provision for the classroom teacher to develop new and varied techniques for instructing and interacting with children, and 5) provision of a great variety of materials both commercial and "teacher-made."

To insure that bonafide diagnostic-prescriptive instruction would be given, inservice training was provided by a specialist in diagnostic-prescriptive development of reading before inception of the study. "On-site" visitation for planning, development, and workshops continued throughout the first year or pilot study. The same training sequence was used the second year, 1978-79. "On-site" consultations between specialist and classroom teacher determined effective use of procedures and

materials developed during training. Monitoring of student growth throughout the three year study was accomplished by a series of six week evaluations. The progress for each child was planned, developed, and evaluated after six weeks. The next six weeks offered a more comprehensive program than the last. In November, March, and June of each year, the principal and teacher discussed each individual student's growth. A conference was then held with the parents. Thus responsibility for student growth was shared by those most concerned for his development.

Data Analysis Procedures

Student progress throughout the three year study was determined by the percentage of gain the student made over and above what he normally would have achieved. A study of each student's prior rate of growth was made by examining his permanent record. Previous standardized achievement test scores were examined. The student's growth rate was determined to be the average of the latest three years gains given in grade level equivalents. The student's porgress for each of the three years of the study were compared to this rate. Growth was said to have occurred if the student progressed one and one-half times his previous rate. Significance was set at the .05 level. Fisher's T-test was used for the analysis of achievemnet scores for students of the Pilot Study. However, for the last two years the T-test for dependent samples was applied as students were exposed to repeated measures employing th e same testing instruments.

Findings and Conclusions

Tables I, II, III, IV, V, and VI list the progress rates of Moore County middle school students who participated in the three year experimental study designed to identify the base for development of a model middle school reading program.

TABLE III 1978-79

Iowa Test of Basic Skills		
Grade Level	Total Percent Achieving Objective	Significant for Study
Grade 8	45%	no
Grade 7	61%	yes
Grade 6	66%	yes
Grade 5	68%	yes
	Total: 57% (Reached Objective)	yes

TABLE IV 1978-79

Piers-Harris		
Grade Level	Total Percent Achieving Objective	Significant for Study
Grade 8	55%	yes
Grade 7	63%	yes
Grade 6	48%	no
Grade 5	29%	no
	Total: 49% (Reached Objective)	yes

TABLE I 1977-1978

Iowa Test of Basic Skills		
Grade Level	Total Percent Achieving Objective	Significant for Study
Grade 8	31%	yes
Grade 7	44%	yes
Grade 6	39%	yes
Grade 5	35%	yes
	Total: 37% (Reached Objective)	yes

TABLE II 1977-1978

Piers-Harris		
Grade Level	Total Percent Achieving Objective	Significant for Study
Grade 8	52%	yes
Grade 7	50%	yes
Grade 6	59%	yes
Grade 5	35%	no
	Total: 51% (Reached Objective)	

TABLE V 1979-80

Iowa Test of Basic Skills		
Grade Level	Total Percent Achieving Objective	Significant for Study
Grade 8 Grade 7 Grade 6 Grade 5	*Data being compiled by statistician at University of N.C. at Chapel Hill. Available September 1, 1980	
	Tentative Total: 69%	

TABLE VI 1979-80

Piers-Harris		
Grade Level	Total Percent Achieving Objective	Significant for Study
Grade 8 Grade 7 Grade 6 Grade 5	*Data being compiled by statistician at University of N.C. at Chapel Hill. Available September 1, 1980	
	Tentative Total: Not Available	

The Moore County middle school study indicates that students in these grade levels demonstrate growth when improvement in program design occurs. Instead of considering the middle school program to be just an extension of the primary grades, attention should turn to design of programs specifically for students in this grade range. Since the percentage of those students who responded to the improved program increased year by year, efforts for designing stronger programs will pay dividends in increased student growth. The data emphasizes once again that reading instruction

should not be decreased at these levels but should continue to be emphasized. If taught directly middle school students will develop more effective reading skills and can do so at a rate beyond what is normally expected of them when a diagnostic-prescriptive approach is used. Reading instruction which is personalized for each student can be effected in the regular middle grade classroom if the teacher first knows the individual's strengths and weaknesses and plans accordingly. The teacher, however, must use the services of all available adults —aides, volunteers, etc.— in order to accomplish such a feat. The supply of instructional materials must also be plentiful. "Teacher-made" materials designed for the student who uses them becomes especially important in this type program. The support of the principal and effective in-service training are vital elements for helping the middle grade teacher design a more effective instructional program.

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SUBSTANCE ABUSE DURING THE MIDDLE SCHOOL YEARS: A NATIONAL PROFILE

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Introduction

According to the eleventh annual Gallup Poll on education (Phi Delta Kappan, September, 1979), the American public considers substance abuse to be one of the most serious areas of concern for schools. However the set of perceptions held by the public is not typically based on fact. A comprehensive, systematic review of the research on substance abuse has not been conducted at any level of schooling. Therefore, the extent of the problem, the way various substances are used and abused, and the age and grade levels of young people when they first begin to use toxic substances are based on conjecture rather than empirical findings. This study is an analysis and synthesis of the most extensive research efforts conducted on substance abuse at the middle school level. The problem areas addressed include types of substances abused by grade level and the extent to which various drugs are abused. It is offered to provide a factual basis for decision-making by middle school educators regarding curriculum planning in the area of substance abuse.

The Literature

The primary studies that will be referred to in this report are longitudinal in nature. Much of the data analyzed is based on a national probability sample conducted by Abelson and Fishburne, 1976, on the reports of 7th and 8th graders in selected counties studied by Blackford, 1977, and on the reflections of drug use during middle school years reported in survey form by senior high school students in 125 high schools throughout the United States as examined by Johnston, et.al., 1979. The sample size of the studies utilized ranges from 2500 to 5700 students.

Analysis Techniques

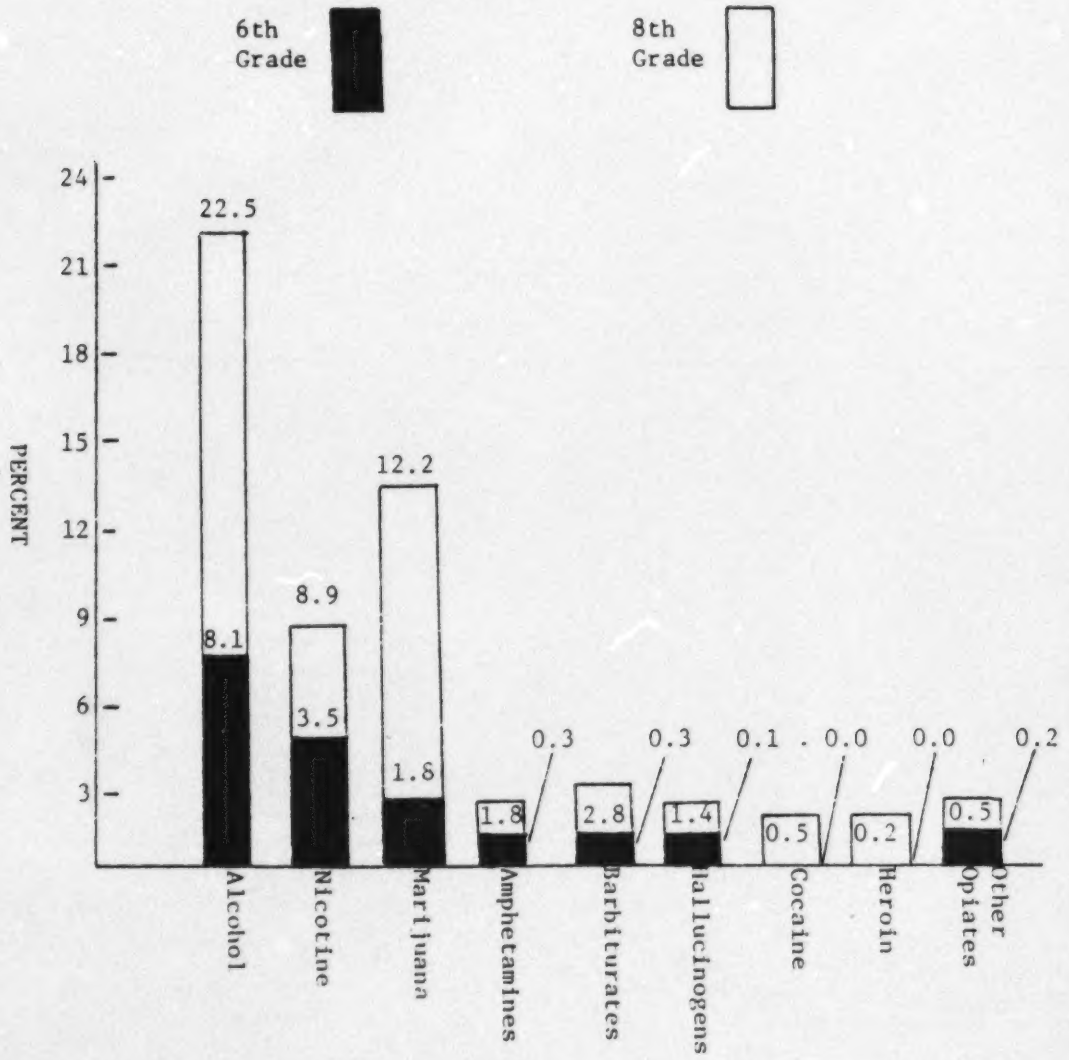
In this survey we shall consider the following groups of chemical substances and their usage by emerging adolescents: (1) alcohol, (2) cigarettes, (3) marijuana, (4) amphetamines (stimulants), (5) barbiturates (including sedatives and tranquilizers), and (6) other drugs including inhalants, hallucinogens, cocaine, heroin, and other opiates. Subgroup differences in the following areas will be examined: sex, college plans, regional, and population density. An overview of all major substances abused will be provided and the data will then be presented in categorical form by each major substance.

Data on Abuse of Toxic Substances

Overview

The data are portrayed by reflecting on usage patterns at the end of the 6th grade and the end of the 8th grade. This manner of representing the data was selected due to a rather abrupt shift that occurs during this period. It may be particularly worthwhile to note the patterns of usage of alcohol, marijuana and nicotine (cigarettes) which are the three, toxic substances most frequently abused by middle school students. Figure One provides a concise, visual summary of the patterns of abuse of all major toxic substances during the middle years. The reader may wish to refer to this figure while reading the following portrayals of abuse of each substance.

FIGURE ONE
PERCENT OF HIGH SCHOOL SENIORS REPORTING
INITIAL USE BY THE END OF THE 6TH GRADE AND 8TH GRADE*
N=5700



*Source: Drugs and the Nation's High School Students: Five Year National Trends U.S. Department of Health, Education and Welfare; Rockville, MD, 1979.

Alcohol

Of the 10 drugs that are frequently abused by middle school students, alcohol is the most widely used, even more than nicotine or cigarettes. Many of the students reported that their initial use of alcohol took place before high school. In the Third Special Report to the United States Congress on Alcohol and Health (1978), it is reported that youth usually have their first drink by age 13. To the degree that there has been any change in use, there has been an upward trend in use in grades 8, 9, and 10 during the early 1970's (Johnston, et.al., 1979).

With regard to subgroup differences in the middle school years, males are more likely than females to have tried alcohol at an early age (Johnston, et.al., 1979). Among 7th-grade students, 72% of the males and 64% of the females reported using alcohol in the last year (Blackford). The research by Blackford further indicates that males maintained higher prevalence levels of regular alcohol use (on at least 50 occasions during the last year). Rachal, et.al., (1975) also found that males aged 13 to 18 were more likely than females to be regular alcohol users.

Other subgroup differences are worthy of comment. Initial alcohol use seems to occur earlier among those students in more urban settings and those in the Northeast. With regard to the South, initial use seems to occur later than average. However the students from more rural environments seem to be increasing their early usage. Females and those who live in the South have also increased their use of toxic substances. Therefore, the sex, regional, and urban differences for early usage are much smaller in the Class of '78 than in the Class of '75 (Johnson, et.al., 1979). The trend in initial use, according to region, size of population and sex is away from diversity and toward uniformity among these subgroups.

Data collected in longitudinal studies also suggest that intial use of alcohol is occurring at earlier ages. In San Mateo County in 1977, about 23% of the males in grade 7 had used alcohol within the last six (6) months as compared with around 11% in 1969. Since alcohol is tried by almost everyone, these data reflect a decline in age of initial use rather than an increase in prevalence (Blackford, 1977). It is important to note that Tennant and Detels (in press, as of 1979) found that among males, early initial use of alcohol, cigarettes, or coffee (at or before age 12) correlated with the excessive use of alcohol and the use of illegal drugs in adulthood.

Out of the 6000 respondents in the Class of '78, 22.5% reported their initial use of alcohol as being in either the 7th or 8th grades. About 9% of the respondents reported that they began using alcohol in the 6th grade (Johnston, et.al., 1979). In summary, the shift from non-use to use between the 6th and 8th grades represents the most prominent change in usage patterns for youth.

Marijuana

According to the National Youth Polydrug Study (1976-77), the mean age for those who chose to use marijuana was 12.8 years for males and 13.1 years for females. In their studies of marijuana use in the Classes of '75 through '79, Johnson, et.al. (1979) reported a continuing increse in the numbers of students trying marijuana in the 6th through 8th grades. By 6th grade, each class had achieved a higher prevalence level than the class before and has remained higher than prior classes at each grade level thereafter. In the Class of '75, 17% of the respondents reported usage before 10th grade. However, this number has risen to 30% for the Class of '79.

Subgroup differences in early use of marijuana seems to parallel differences in general use. The subgroups with the greatest general percentage of marijuana use also exhibit the greatest percentages of usage at earlier grade levels. An increase in early use has been exhibited among all subgroups. A rise in early use is particularly noteworthy among females and the college-bound initiating a close in the gap between these sub-groups and the bulk of the population.

Nicotine

A comparison of the Classes of '75 through '78 shows a continuing decline in the average age at which smoking began. While only 14% of the Class of '75 (N=3085) reported regular smoking before 10th grade, 20% of the Class of '78 (N=5960) reported that to be the case. Of the seniors in the Class of '78 who smoked on a regular daily basis, almost two-thirds (2/3) began smoking in the 9th grade or earlier.

Perhaps the most noteworthy finding is the relatively low percentage of cigarette usage by the total population. This is most likely due to the current governmental policy requiring warnings to be printed on all cigarette advertisements, linking cigarette usage to poor health.

Amphetamines

Johnston, et.al. (1979) found that amphetamines accounted for more of the illegal drug use among high school students than any other class of drugs except marijuana. Interestingly, among the seniors in the Class of '78, 11% of all students surveyed reported that they were initiated to amphetamine use by a physician. In particular, students from the West indicate a high usage rate of early amphetamine use.

Only 2% of the population surveyed indicated usage prior to 9th grade. This is a small percentage of middle school students. However, by the end of the high school years, 23% indicated usage of amphetamines (Johnston, et.al., 1979). The high usage rate by the end of the high school years does have implications for substance abuse program planning at the middle school level.

Barbiturates

In analyzing the use of sedatives, Johnston, et.al. (1979), found successively higher usage rates in the younger age brackets. After 1975, prevalence of usage rates at the 6th and 7th/8th grade levels decreased, suggesting that sedative use probably reached a maximum at these grade levels in 1975. A parallel pattern was found in this study and the study referred to on amphetamines--students from the West showed a particularly high prevalence of early sedative use.

With regard to tranquilizer usage among the Classes of '75 through '78, the same researchers found a shift toward earlier first usage. Like the use of sedatives, prevalence rates at lower grade levels were increasing during the early 1970's.

Concerning subgroup differences in the Class of '78, early initial usage was found to be higher among females than males and among the noncollege-bound than the college bound. Students from the West showed a higher usage rate of tranquilizers at an earlier age. In addition, the

increase in early usage found in the Classes of '75 through '78 is reflected in almost all of the subgroup data. Interestingly, this increase has been greater than average, again, among females, the noncollege-bound, and students in the West.

In considering the use of both sedatives and tranquilizers, we find that the latter are used to a greater degree at earlier grade levels. When the two categories of barbiturates are considered together, barbiturate usage is greater than the use of amphetemines.

Inhalants

Inhalants include any aerosol or gaseous fumes, other than smoke, which are inhaled to make the user feel good or "high" or intoxicated. The following substances are included in this category: glue, paint thinner, aerosols from spray cans, amyl nitrite ("poppers," "snappers"), and butyl nitrite (Locker Room, Rush, etc.)

Among those students claiming to have tried inhalants, initial use seemed to occur at the 7th-9th grade levels. Regarding subgroup differences, males and the noncollege-bound were the most likely to have used inhalants at very early grade levels (i.e., before 7th grade) (Johnston, et.al., 1979).

Due to the early usage of inhalants and the especially early usage by males, it is quite necessary that some form of action be taken early enough to prevent use of these substances.

Hallucinogens

Hallucinogens are the psychedelic drugs. In the 1975-76 national household survey (Abelson and Fishburne, 1976), only 8% of the sampled youths aged 12 to 17 claimed to have ever tried hallucinogens. The prevalence of any use among this age group had increased from 6 to 8% from 1972 to 1976. Also, experimentation with hallucinogens seemed to have increased during the early to middle 1970's, but does not now appear to be widely used at the middle school level.

Cocaine

Cocaine is a very expensive substance and this may explain, in part, why it is not used with greater frequency among students. In the national probability household survey, Abelson and Fishburne (1976) estimated cocaine usage to be at only 4% among the 12- to 17-year-old population. With regard to subgroup differences, Johnston, et.al. (1979) found a slight increase in use between the Classes of '77 and '78 among students in the Northeast and North Central sections of the country. However, the greatest increase was found among students in the West.

Heroin

Heroin was found to be the drug most often perceived by high school students as having a high risk of harm. It also received the greatest social disapproval. Consequently, of the illegal drugs considered in this survey, heroin seems to be the least widely used. Nevertheless, the extreme social disapproval of this drug may tend to depress respondent willingness to report usage: therefore, usage figures must be considered with caution. Because underreporting biases are likely to remain constant from year to year, trends in use may be estimated more reliably than the absolute prevalence figures.

The data indicate that heroin usage is minimal and does not seem to pose a serious problem. No substantial increase in usage was found in all of the studies examined.

Other Opiates

The class of drugs entitled "other opiates" includes both the natural and synthetic opiates (e.g., methadone) other than heroin. In the Class of '78, only 1.5% of the students surveyed reported experience with such drugs before 9th grade. However, for the Classes of '75 through '78, the use of these opiates had increased at all grade levels until 1975. This was true in all subgroups. Once again, a greater increase in early use seems to have taken place in the West (from 1.8% to 5.8%) (Johnston, et.al., 1979).

Although the use of hallucinogens, cocaine, heroin, and other opiates are not prevalent at the middle school level, the use of these substances increase during the high school years (Johnston, et.al., 1979); consequently, we see the need for a preventive measure at the middle school level.

Findings

- The greatest shift from non-usage to usage of toxic substances occurs between the 6th and 8th grades.

- A relatively steady increase in the use of all toxic substances has taken place in the last five years (1975-1980).

- Alcohol and marijuana are the two substances most frequently abused by middle school students.

- Of all substances considered, nicotine is the substance abused at the third highest rate. It is used substantially less than alcohol and marijuana.

- Though amphetamines and barbiturates are not widely used by middle school students, there is a substantial increase in usage by a small population between the 6th and 8th grades.

- The use of hallucinogens, cocaine and other opiates is not widespread at the middle school level. However, there is a substantial increase in the usage of these toxic substances at the high school level. This may have implications for the middle school.

Conclusions and Implications

The data indicate a relatively steady increase in substance abuse over the last several years. If one combines this fact with the findings that reflect the shift from non-usage to usage between 6th and 8th grade, a strong research basis emerges lending support to the development and implementation of a comprehensive substance abuse education program no later than the sixth grade. The substantial increase in the use of hallucinogens, cocaine and other opiates also suggests the need for a substance abuse effort in the earlier years prior to the onset these addictive drugs prior to high school.

When examining the relatively low level of abuse of nicotine, it can also be concluded that societal pressures (i.e., through legislation, the media and education) can diminish the use of a toxic substance. This is particularly true of nicotine. One could also speculate that the reverse is true for marijuana. As society moves towards legitimizing the use of this substance, it becomes more widely used. However, additional research needs to be undertaken to validate this hypothesis.

The strongest conclusion that emerges from this synthesis of the research on substance abuse is that a carefully designed, comprehensive program dealing with the use and abuse of toxic substances must be undertaken not later than the middle school years. It is probably best to begin the basic coverage of various substances in the elementary years--prior to that drastic shift that occurs between the 6th and 8th grades.

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